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Depressions of the Earth.

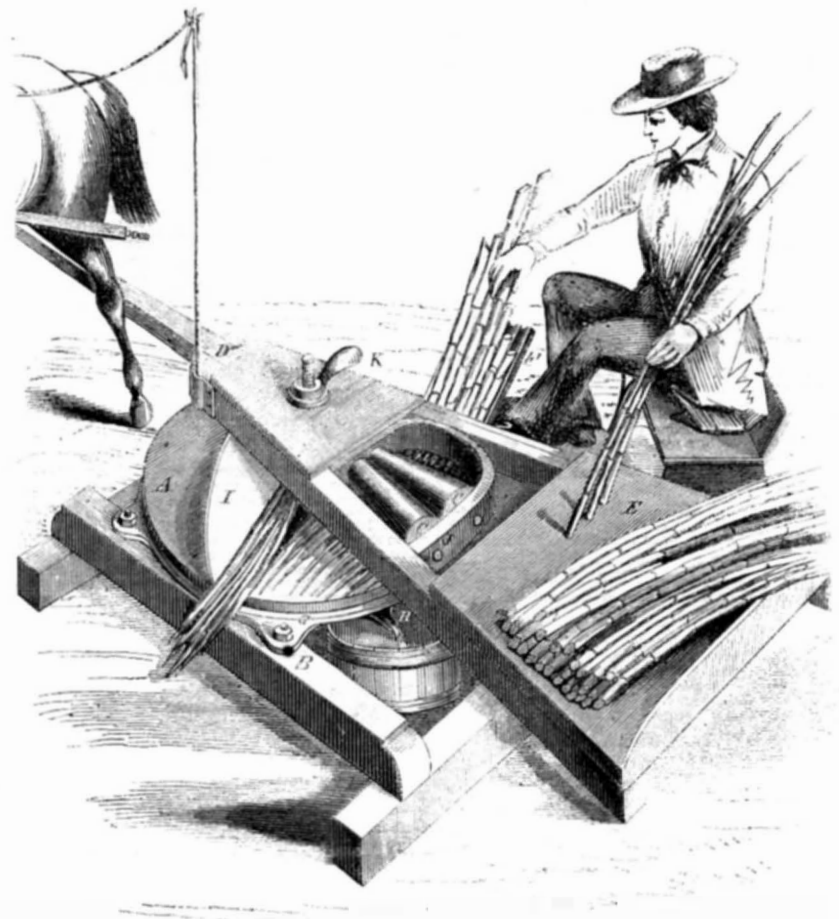
Surprise has been manifested and inquiries have been made as to the cause of mountains, but the cause which produced the valleys or depressions of the earth is just as much a matter of wonder. Some suppose—indeed, it is a very general opinion—that all the lower parts of the earth's surface are covered with water, but this is not exactly so. Seas, lakes and rivers are only lower than surrounding lands, but there are many inhabited portions of our globe which are much lower than some great seas and lakes. Thus the waters of Lake Erie are about two hundred feet higher than the rich cultivated plains surrounding Lake Ontario, but the latter lake is some feet lower than these plains, and is the receptacle of their drainage waters. The most extensive and wonderful depression of the earth is in Asia. It is a vast region of about 18,000 leagues square; it is occupied, to be sure, mostly by the Caspian Sea, but it also contains populous cities and extensive cultivated districts situated in a depression of three hundred and twenty feet below the level of the Black Sea.

It is an opinion pretty generally admitted by scientific men at the present day, that the mountains have been formed by the upheaving of their materials, and that they have issued from the bosom of the earth. The necessary consequence of a vast upheaval would be the depression of another portion of the earth. Asia abounds in lofty mountains, and the vast depression of the Caspian Sea and its adjacent plains is surrounded with great mountain chains, hence it is supposed that the elevation of these masses caused a consequent depression of the Caspian valleys.

Invention of the Microscope.

It was in 1664, when John Milton's "chief of men," who had wielded the power of England with a firm and vigorous hand, strongly contrasted with the royal but feeble fingers which previously and subsequently endeavored to direct it, had gone to his account, and just after the rupture of the close union which had endured, almost without interruption, for nearly seventy years, between England and Holland, that a Dutch youth of eighteen, holding a glass thread in the flame of a candle, perceived that the melted extremity assumed a spherical form. The intelligent lad instantly seized on the happy accident. He had seen Leuwenhoeck manufacture lenses, such as they were, and went on burning his glass threads, and attempted to place his little spheres between two pieces of lead, through which he made an aperture with a pin's point. Placing a hair before this simply-constructed instrument, he found to his great joy that he was the maker and possessor of a capital microscope for those times, and he secured to the micrographers of the day what they had so long sought.—*American Druggists' Circular.*

DAKE'S IMPROVED SUGAR MILL.



The accompanying engraving represents a most valuable mill for crushing sugar cane, patented April 27, 1858, by Frederick E. Dake and Thomas E. Hunt, (assignees of Frederick E. Dake, of Indianapolis, Ind.,) which from its power and simplicity recommends itself to all who use sugar mills and crushing apparatus.

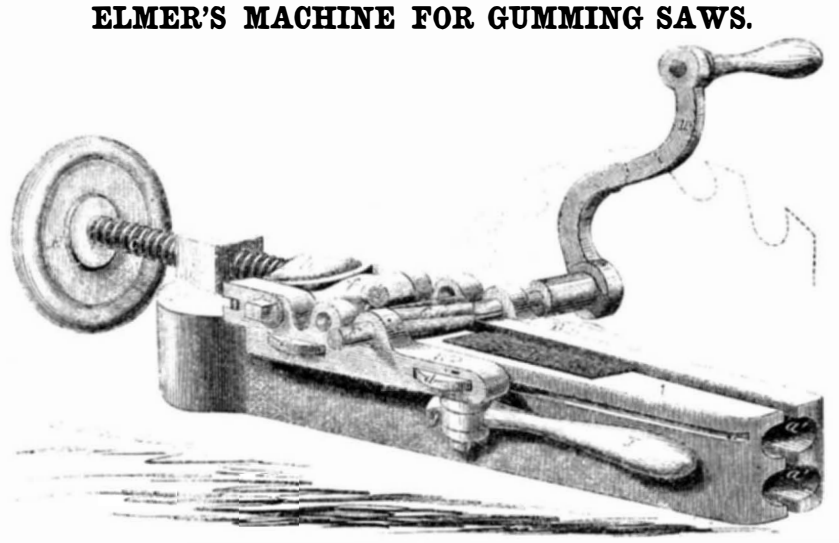
The peculiar advantages of this mill are its cheapness of construction, requiring no gearing, and such compactness of form as insures its portability, and easy management by a single operator. It is also so arranged as to secure a uniform pressure upon stalks of various sizes.

A is a bed plate, firmly attached to the platform, B. C C are rollers in the frame, J, which is allowed to oscillate upon journals. The lever frame, D, at E, increases the pressure to any extent desired. The contact of the rollers, C C, with the bed plate, A, is regulated, securing the required pressure by adjusting the set screw, K.

The cane is fed into the hopper, F, and as the lever frame, D, is revolved, it passes under the rollers, C C. The juice is expressed upon the bed plate, A, in front of the rollers, C C, and running into the groove, G, is discharged at the spout, H. The crushed cane is scraped from the bed plate A, by the scraper I, as the rollers pass over it.

Communications desiring further information may be addressed to Hunt, Dake & Co., Indianapolis, Ind.

ELMER'S MACHINE FOR GUMMING SAWS.



A saw when it is to be gummed should be held perfectly firm that it may be cut quite true, and the cutting tool should be of such construction that it will fairly cut away the metal and not tear it. The machine for filing, gumming and jointing saws (of which our illustration is a perspective view) is the invention of H. O. Elmer, of Mexico, N. Y., and was patented by him Feb. 2, 1858, and assigned to J. P. Slack and P. J. Babcock, of the same place.

A represents the bed or frame of the machine. This frame is composed of two parallel metal bars connected at one end by a bolt passing through a block that determines the distance apart between the parallel bars. B B represent two bars, each of which is provided with friction rollers, *d d*, running in grooves, *a*, of the frame, A. The front end of the bars are connected by a curved traverse bar, *f*, in which the end of a screw rod, C, is fitted and allowed to turn freely. A spiral spring is placed on the end of this rod and confined between the bar, *f*, and a plate, *h*, attached to the bar, the curve of the bar forming a place to receive the spring. The rod, C, passes through a nut, D, placed on the end of the frame, and the outer end of the screw rod is provided with a hand wheel, E.

F is a shaft which is placed transversely on the bars, B B, and it carries the cutter, G. This cutter is cylindrical, and the cutting edges are of a zig-zag form, or are placed spirally around it. A crank, H, is used to rotate the cutters. It will be seen that by rotating the wheel, E, the bars, B B, and cutter, G, may be moved back and forth on the frame, A. To the inner side of one of the frame bars is attached a plate, I, and at the outside is a lever, J, provided with a cam so arranged that by pulling out the lever, J, the cam will force the saw against the plate, I, and hold it firm in the frame between the bars. *a' a'* are grooves in bars of the frame to lighten it, and at the same time not to interfere with the grip. K is the saw.

The implement is used as follows:—The frame is passed on the saw, and the bed is firmly clamped to the saw by turning the lever, J, so that it will be pressed against the plate, I. The gummer is then rotated with one hand by the crank, H, while the other hand is employed in operating the wheel, E, which keeps the cutters against the saw which operate on the upper and under surfaces of the teeth, thus making them of uniform size, and the spaces between are also made uniform. By this mode of constructing the frame the gummer is applicable to reciprocating as well as circular saws, for the back being open, it can be fixed on a saw of any width.

Any further information concerning this gummer can be obtained by addressing the assignees as above.

New Remedy for Consumption.

Ergot of rye, or spurred rye, has received the approval of the Academy of Medicine at Turin, as one of the most active remedies for consumption. Dr. Parola, the author, describes its action as infallible, if not in curing the disease, at least in staying the pulmonary inflammation which constantly accompanies the formation of the tubercle. He administers thirty-one grains of the powder per day, and suspends it every four or five days for forty-eight hours. When the stomach is too weak, the resinous extract may be administered in pills instead of the powder, to the amount of one and a quarter grains, or else a portion in a solution of gum. Quinine, foxglove, and even opium, may sometimes be administered together with it. By this treatment Dr. Parola has cured sixteen cases out of thirty-one of alleged confirmed consumption in an advanced stage.

Hot Air Engine for Egypt.

A very neat and well-made hot air engine was shipped for Egypt from this city by the Ericsson Co., on the 9th inst. It is designed to pump water from the famous river Nile, to supply one of the palaces of the Pasha.

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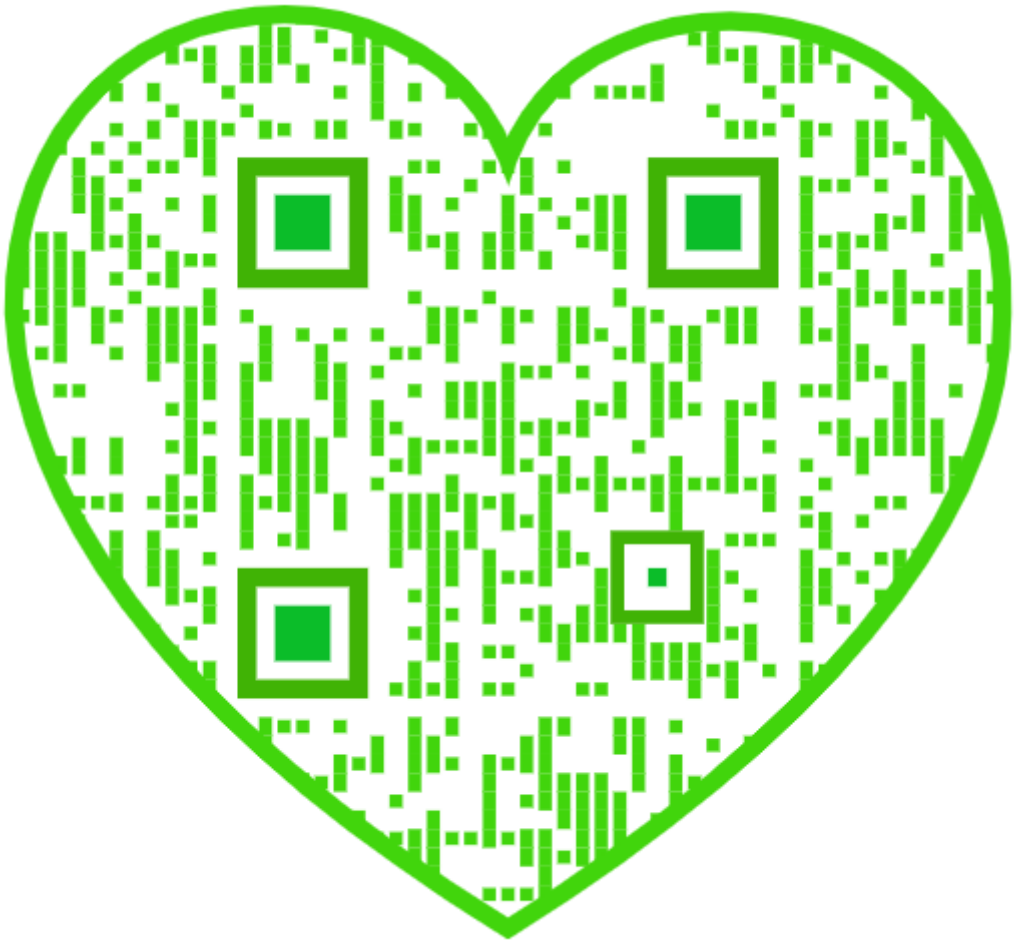

Issued from the United States Patent Office

FOR THE WEEK ENDING JUNE 8, 1858.

[*Reported officially for the Scientific American.*]

WASHBOARD—Silas M. Barrett, Rufus S. Lee, and Jabez M. Waters, of Cincinnati, Ohio: We claim the teeth, d d d d, made and arranged as represented, to the edges of corrugated sheets of metal for washboards for increasing and holding the edges of the sheet of metal in and to the sides of the legs of the board, as represented, and for the purposes mentioned and described in the specification.

MACHINE FOR MEASURING, REGISTERING, AND RECEIVING GRAIN DIRECT FROM THRESHING MACHINES—Peleg Barker, of Moscow, Mich.: I claim the combination and arrangement of the parts, substantially as described, for receiving, measuring, and registering grain direct from threshing machines.

I also claim in combination with the machinery for registering, substantially as described, two or more measures or boxes, constructed and operated as described, for receiving the material to be measured.

RAKING ATTACHMENT TO HARVESTERS—John A. Barrington, of Fredericktown, Ohio: I claim the reciprocating or vertically moving rack piece, R, operating substantially as described, in combination with the shaft, B, having an intermittent connection with the crane, and the rakes, f f', operated from the rotation of the shaft, arranged and operating substantially as and for the purposes specified.

I also claim the combination of rakes, f f', slides, b, to which they are hung, and the grooves, g, of the crane arm, substantially as and for the purposes set forth.

LOCK—Joseph A. Braden, of La Grange, Ga.: I claim the slides, G, placed relatively with the bars, B B, as shown, and provided with the stationary teeth, h, and yielding teeth, h', in combination with the bits, H, placed on separate arbors, and arranged to operate as and for the purpose set forth.

[This invention consists in the employment of a series of slides provided with teeth or racks, and arranged relatively with a bifurcated bolt, into the parts of which the ends of the slides work, these parts being used in connection with a series of bits attached to separate arbors, placed one within the other, and operated by means of keys or knobs, so that the lock is rendered unpickable, and at the same time perfectly simple in construction.]

APPARATUS FOR SUPPLYING WATER TO STEAM BOILERS—George Brodie, of Little Rock, Ark.: I claim the arrangement and combination as shown and described, of the cylinder, A, cylinders, B B, pistons, D D E E, and cisterns, C C, for the purposes set forth.

[A notice of this improvement will be found in another column.]

BEDSTEAD FASTENINGS—George Burket, of Crogham, Ohio: I claim forming a bedstead fastening by a straight pin through the tenon, and two oblique pins through the mortise, as set forth and represented.

MOWING MACHINE—John Butter, of Buffalo, N. Y.: First, I claim the combination and arrangement of the jointed levers, C D E, for the purpose of supporting the driving wheel, and giving flexibility to the machine, substantially as set forth.

Second, I claim the arrangement of the carrying wheel, L, near the heel of the cutter bar, so that the finger bar will pass through the wheel, and the cutter bar (or connecting rod) also vibrate through the wheel, substantially as described.

Third, I claim constructing the guard fingers so that they may be connected to the finger bar, and support it clear from the ground, and also allow the cutter bar to work on the underside of the finger bar, as set forth.

Fourth, I claim the sleeve, W, when connected with the spring bars, H H, for the purpose of supporting and adjusting the driver's seat on the axle of the driving wheel, as described.

Fifth, I claim the arrangement and support of the raker's seat on the lever, C, as set forth.

Sixth, I claim supporting and carrying the outer end of the finger bar, by means of the specific arrangement of the divider, N, wheel, L, and spring, O, as described.

METHOD OF ATTACHING ORNAMENTS TO THE EAR—William B. Carpenter, of Brooklyn, N. Y.: I claim the mode of attaching ornaments to the ear without boring or piercing holes therein by the use of the hooked shaped wire, B, in connection with the wire, A, and the spring, C, substantially as and for the purpose as described.

SEWING MACHINES—David W. Clark, of Bridgeport, Conn.: I claim regulating the extent of the feed by expanding or contracting the rear end of the lever, E, substantially as described.

WASHING MACHINES—Edward B. Clement, of Barnet, Vt: I claim the adjustable foot brake, V, in combination with the slatted elbow brakes, L L, and connecting rods, U U, the whole made and operating substantially as described, and for the purpose set forth.

ADMITTING LIGHT AND AIR THROUGH STEPS, &c.—John B. Cornell, of New York City; I claim as a new manufacture an illuminating and ventilating riser for door-sills, &c., composed of a perforated and partially glazed front plate, E, combined with an inner inclined glazed sash, C, substantially as set forth.

PRESERVE CANS—H. G. Dayton, of Maysville Ky.: I claim the employment of the rubber band in combination with a metal cover and metal clamp, substantially as set forth.

[This invention consists in the employment of an india rubber band attached permanently to the cover, in such a manner as to enable it to lap over the sides of the can and cover the joint, and keep the latter closed tightly by the shrinking consequent upon its elasticity. It further consists in the employment of an elastic metal clasp around the india rubber band to secure it in place upon the can. It is an excellent improvement, and will be illustrated in our columns in a few weeks.]

BED BOTTOM—Benjamin Griffin, of Lawrence, Mass.: I claim the mortise bar, the open link, the lifter spring with the tapered slat, when combined and arranged for a bed bottom in the form and manner as specified.

WRITING DESK—Joseph H. Grimsley and Perry J. Aukney, of New Lexington, Ohio: We claim the application to, or construction of, writing tables or desks, in the manner substantially as set forth and described.

[We publish the above just as it comes to us; but it evidences an omission of the copyist.]

MACHINE FOR CUTTING OUT STUMPS—Frederic Kettler, of Milwaukie, Wis.: I claim the circular frame, A, and the revolving frame, E, in combination with the cutting apparatus, substantially in the manner and for the purposes set forth.

APPARATUS FOR THE MANUFACTURE OF BEER—Geo. Habich, of Roxbury, Mass.: I claim the combination, arrangement, and connection of the copper, the mashing tun, the filtering vessels or vessels, and the hop vessel, substantially as specified, whereby the several operations connected with each of such parts, can be conducted, through the agency of the heat, from one furnace, and steam from its copper, substantially as specified.

I also claim combin g and arranging the wort warmer with the copper, the hop vessel, the filtering vessel or vessels, and the mashing tun, so as to operate therewith substantially as set forth.

I also claim the combination of the condenser, d, the hop vessels, the copper, the filtering apparatus, and the mashing tun, as connected and arranged so as to operate together, substantially as specified.

I also claim the arrangement and combination of the water heater, the mashing tun, the filtering apparatus, the hop vessel, and the copper, as connected and made to operate together, substantially as set forth.

EXTENSION TABLE—William Heerdt, of New York City: I do not claim, broadly, the employment or use of metal plates in the construction of slides or guides for extension tables, for they have been previously used, although, so far as I am aware, not in connection with wooden bars.

But I claim the metal plates, a b, attached to the upper and lower surfaces of the bars, B B' C, swaged or so formed as to be provided with ledges and grooves, c d, which fit one into the other, the whole being arranged as and for the purpose set forth.

[This is an improvement in the slides or guide bars of the table, whereby the slides or guide bars are not only firmly connected with each other, but are also allowed to slide freely past each other, so that the table may be readily folded and extended, and still be kept perfectly firm in every position.]

MACHINE FOR GRINDING AND CUTTING—Franklin B. Hunt, of Richmond, Ind.: I claim the arrangement in the same machine of the two peculiarly constructed hinged adjustable troughs or boxes, B C b, spring set bar, s s' s2, and cutter or grinder shaft, E, with spring key, e e', and radial arms, 6 7 8 9, substantially as and for the purposes set forth.

STOP WATCH—Charles E. Jacot, of New York City: I claim the manner described of allowing motion to the independent train by a pin or its equivalent on the escapement lever acting on the arms of the "whip" or "fly," and letting one arm pass at each pulsation of the balance, as specified.

PLATFORM SCALES—J. F. Keeler, of Cleveland, Ohio: I claim the application of a device for leveling the bearings of platform scales, when arranged substantially as described.

I also claim combining with platform scales a weighted lever or indicator, in such a manner that the platform scales may be used either with or without it, substantially as set forth.

BENCH PLANE—H. L. Kendall, of Baltimore, Md.: I am aware that wedges have been inserted in plane mouths for compensating for wear on the under surface of the plane; such, therefore, I do not claim.

But I claim the compensating piece, C, formed as described, so as to be tightened by the gripe, and have its face, f, move parallel to itself, as specified, whereby the opening in front of the bit is not diminished by adjustment of the compensator.

DEVICE FOR ATTACHING BITS TO THE BRACE—Sam. U. King, of Windsor, Vt.: I claim the mode of fixing the tool or auger in its handle or bit stock, viz., by the projection, b, on the tool, in connection with the wedge C, and the spring, D, applied to the handle or stock, A, and the socket, a, thereof, substantially as specified.

REVOLVING FIRE ARM—Moses Kinsey, of Newark, N. J.: I claim furnishing the dog, G, with the additional tooth, K, arranged to operate in combination with square or equivalently formed bottom parts of the backs of the teeth of the ratchet wheel, D, in the manner and for the purpose described.

[The dog which is attached to the hammer is furnished with an additional tooth, so arranged relatively to the tooth which rotates the chambered cylinder, and to the ratchet wheel of the cylinder, as to act as a stop in combination with one of the teeth of the cylinder, to prevent the latter being rotated beyond the proper distance, the teeth of the ratchet wheel being properly formed for this purpose.]

CARRIAGE SPRINGS—David M. Lane, of West Philadelphia, Pa.: I do not claim, broadly, the combining of wood and steel in the manufacture of springs for vehicles, for this has been previously done.

But I claim providing the extremities of the plates, A A', with sockets, c, to receive the ends of the wooden springs, B B', as and for the purposes set forth.

[This a novel mode of constructing the elliptic spring for vehicles, whereby the spring is made lighter than usual, equally elastic, and as strong, and the cost is much reduced. The invention consists in constructing the spring of steel and wood combined—curved bars of elastic wood, such as hickory, being secured in a peculiar way to the inner and steel main plates.]

BURNERS FOR VAPOR LAMPS—C. B. Loveless, of Syracuse, N. Y.: I do not claim of itself the burner and chamber on which it is situated.

But I claim the crescent-shaped generating chamber, d, as described, and its arrangement with the siphon tube, chamber, c, and burner, f, substantially as and for the purposes set forth.

REFRIGERATING PITCHER—W. W. Lyman, of West Meriden, Conn.: I make no claim to a valve in the end of the nozzle, or on the lid of the pitcher, as valves have heretofore been placed there.

Nor do I claim a single valve located anywhere.

But I claim in the manufacture of ice pitchers, the particular location of the valve, viz., in the throat of the nozzle, when said valve shuts into instead of against the opening, and is constructed with double sides, or made hollow, provided with a projection lip or shoulder, f, and having its seat provided with a lip or shoulder, g, substantially as shown and described.

PIANOFORTE ACTION—John V. Marshall, of Albany, N. Y.: I am aware of the existence of the patent issued to James A. Gray, March, 1857, for an action intended to effect a movement of the hammer somewhat similar to that described in my specification; but I expressly disclaim the use of mechanism like that set forth in his specification as constituting his claim, to make an action such as I produce upon the hammers of a pianoforte.

What I claim is, the formation and position of the but as described, and for the purposes set forth.

I further claim the combination of the butt spring, S, and back cheek, substantially as arranged, and for the purposes set forth.

DEVICE FOR OPERATING THE BOLT TO OBTAIN TAPER IN SHINGLE MACHINES—Elijah Morgan, of Morgantown, Va.: I claim the combination of the eccentric roller, F, the swings, H H, and the lever stop and switch, substantially in the manner and for the purpose set forth and described.

METHOD OF TANNING—Jesse Morgan, of Sumterville, S. C.: I claim the compound composed of saccharine matter, glauber salts, and muriate of soda, in about the proportions set forth, for the purpose of expeditiously completing the process of tanning, as described.

[A full description of this invention is given in another column.]

BREECH-LOADING FIRE-ARMS—George Wettorse, of Baton Rouge, La.: First, I claim the percussion rod in a movable breech piece, in combination with the sliding bolt, when so arranged that the lock in the act of firing, shall both make fast the breech-piece and fire the charge.

Second, I claim the construction and use of the globular surface on the front end of the movable breech piece, in combination with the end of the cylindrical cartridge case, for the purpose of more effectually preventing the escape of gas at the joint.

Third, I claim the construction and use of the lever, when arranged substantially as described, for the purpose of retracting the cartridge case.

BRAKE FOR WAGONS, &c.—Benjamin B. Munroe, of South Dansville, N. Y.: I claim, first, The brake bar, B, when jointed in the manner and for the purpose set forth.

Second, I claim the extension perch, constructed in the manner specified.

MACHINE FOR CUTTING IRREGULAR FORMS—William N. Oakes, of Dana, Mass.: I claim the combination of the two carriages, B C, having a rectilinear motion at different speeds, with the elongated pattern, tracers and cutter, for the purposes set forth; not intending to claim an elongated pattern as such, or combined with other machinery to cut irregular forms, but only its combined with two carriages having a rectilinear motion at different speeds, in the manner described.

IMPROVED HELIOGRAPHIC INSTRUMENT FOR TAKING THE SUN'S ALTITUDE—John Oakes, of New York City: I have stated that the main object of my invention is to find the altitude of the sun when the horizon is obscured; but I by no means intend to confine its application to that condition, as it is obvious that it can be used as well when the horizon is visible; but it is under the former condition that it possesses an advantage over the quadrant and sextant.

I do not confine myself to the use of any particular sensitive preparation for the concave surface of the hemisphere.

But I claim the hollow hemisphere having its concave surface prepared with a sensitive coating, and having an orifice in the center of its equatorial plane, through which to admit the sun's rays, to act upon the said sensitive coating, substantially as and for the purpose set forth.

And I also claim the graduated plate, G, with its appendages, combined with the hollow hemisphere, substantially as described, for the purpose specified.

[See description of this invention on another page.]

COMBINED UMBRELLA AND HEAD REST—Charles G. Page, of Washington, D. C.: I claim combining a head rest with an umbrella, as set forth.

BEE HIVES—Thomas Prosser, of Birmingham, Pa.: I claim the combination in bee hives of the labyrinthian passages, a a a, suspended shafts, H H, and glass entrances, G G, when said parts are constructed and arranged relatively to each other, in the manner and for the purposes set forth.

RATCHET PRESSES—Philip H. Raiford, of Mobile, Ala.: I claim the combination of the eccentric pawl and ratchet with the platen of a press, substantially as described.

REVOLVING HEELS OF BOOTS AND SHOES—James H. Roome, of New York City: I claim the combination of the slotted or perforated slide, F, bent at its forward end as described, with the hub bed shank, C, and notched rim plate, H, arranged and operating substantially in the manner set forth.

[The nature of this invention and improvement consists in securing the revolving portion of the heel to the boot in such a way as t enable it to be readily attached and detached when desired, and revolved and securely fastened at every quarter revolution, to compensate for tne inequality of wear.]

EXCAVATING MACHINE—Nathan Sanders, and F. T. Sherman, of Chicago, Ill.: We claim the extension fulcrum piece in combination with the dipper shaft, in the manner set forth, so that when the dipper shaft arrives at the point necessary for shifting the fulcrum, the fulcrum piece may be thrown into gear and be carried to the extremity of the crane for the purposes set forth.

INK ROLLERS—Alexander Schimmelfennig and Julius Ende, of Washington, D. C.: We claim to manufacture ink rollers out of elastic gums, such as caoutchouc or gutta percha, or of compounds of the latter in the modes described in the specification, or in any similar modes.

AUTOMATIC GRAIN-WEIGHING MACHINE—William and Thomas Schnebly, of Hackensack, N. J.: We do not claim to be the first inventors of weighing machines in which the weight of the grain was made to open and close valves for regulating the supply and discharge of the same, for many such machines have been made.

Neither do we claim, broadly, in weighing machines, the operating of the parts which control the supply and discharge of the grain by means of the scale beam, or by means of parts connected with the scale beam; many other machines have been made in which this feature is seen—the patent of W. H. Bramble, April 8, 1856, is an example in point. In this device a connection is made for one of the purposes just mentioned, with the scale beam; our connection is behind, or in the rear of the fulcrum. It is a great and important point to have the scale beam elongated in front, or in advance of the fulcrum, and to operate the parts which control the supply of, and discharge of, the grain, by arms, M M'', in front of the fulcrum. This arrangement permits the discharge valves, O O, to be kept open for the full exit of the grain until the opposite tub, I, has been filled. The valves could not thus be kept open if they were operated by means of the rear end of the scale beam. The use of the elongated arm in front of the fulcrum also permits a great simplification of the machine, and dispenses with the necessity of connecting rods and levers, lessens the number of points of friction, and promotes the probabilities of accuracy.

We therefore claim the weighing of grain, &c., automatically, under a continuous flow or otherwise, without employing the gravity or weight of grain, being weighed for the purpose of checking or cutting off the supply of grain entering into the receptacles to be weighed, or for the purpose of discharging the grain from the receptacles in which it has been weighed, during the period of the process of weighing, or when the quantity of grain is being determined or weighed, substantially in the manner as set forth.

We claim providing the hopper with hinged valves, each having a lever with a weight on it, and attached thereto, when used in combination with projecting arms, which are made to operate the same, in the manner and for the purpose as set forth.

We claim the balanced valve in its location below the hopper, and above the stationary chute or bridge, when used in combination with projecting arms, cams, &c., and a pendulum with an adjustable weight, in the manner and for the purpose substantially as set forth.

We claim the toggle joints in combination with vertical hinged valves, when operated on and for the purpose as substantially set forth.

STEAM POWER METER—George Schuh, of Madison, Ind.: I claim the combination of the one independent piston, a, working in its cylinder, A, and actuated in opposite directions alternately by the steam from opposite ends of the engine cylinder, acting successively on its opposite sides or faces, carriage, B, pendulum, H, main spring, m, secondary spring, i, friction wheel or roller, c, and disk, E, arrrnged for operation together, in the manner and for the purposes set forth.

Second, I also claim driving the disk, E, in both directions of its travel, by cords, T, operated by the engine, whereby a velocity corresponding to the velocity of the piston of the engine is at all times, and throughout both strokes, communicated in a positive and accurate manner to the friction wheel, c, for the purposes mentioned.

Third, And I further claim providing the driving cords, T, with compensating springs, z, when said cords and springs are combined for action with the reciprocating disk, E, and reciprocating head-block, or its equivalent, of the engine piston rod, essentially as described, to prevent material pause of the disk at the end of each stroke, and irregularity in the action of the disk, by the driving pull on either cord, alternately producing stretch and the relaxing of either cord, when not acting as a driver, for the purpose of securing accuracy in registering, as specified.

HARVESTING MACHINES—Wm. H. Seymour and Dayton S. Morgan, of Brockport, N. Y.: We are aware that various modes of changing the gear and the velocity of the cutter have been used in which the adjustments are arbitrarily made, but these require skill and care on the part of the persons employed. These we do not claim.

But we claim, first, The combination of the changable pinions and gear wheel actuating the cutters of reaping and mowing machines with their centers so situated relatively, that the changeable parts shall always exactly fit and gear when properly placed and not otherwise, the whole being arranged and operating substantially as set forth.

Second, The combination of the replacable pinions with the series of holes for the axle of the driving wheel of reaping and mowing machines, so arranged with relation to each other that while the rate of motion of the cutter is changed, the hight of the cutter from the ground may be varied at the same time, the proper rate of motion for the different hights being always secured, and in such manner that the changable parts shall always fit and gear when properly placed and not otherwise.

PUNCHING MACHINES—D. S. Sherman, of Lowell, Mass.: I do not claim the device shown in the patent of R. H. Cole, dated June 3, 1856.

But I claim the manner of punching a nut, washer or other article from plate or bars, by forcing it half way out (or more or less) in one direction into a die, and then forcing it entirely out in the opposite direction into another die, for the purpose of making the outside edges of the nut perfectly square and free from a sharp or burr edge, substantially as described.

PROVISION CUTTER—Wm Smith, of Cincinnati, Ohio: I claim the arrangement of the semi-cylindrical piece, M, and guide slides, R, arranged with the stock, a, and circular plate, f, all as constructed for feeding the provision to the cutters as mentioned.

I also claim the arrangement of the screws, J J K, and S S, with the cutters, h, and plate, f, for adjusting the cutters from and to the plate, as represented, for purposes mentioned in the specification.

BEDSTEAD—Wm. St. Charles, of Fairmont, Va.: I do not claim, separately, any of the parts described.

But I claim the combination of the old devices newly arranged in the following manner—The collar, L, the tenons, A B C D, the holes, A B C D, the nuts, e f g h, and cylindrical bearded wire, arranged in combination with the construction of the head and foot board, I I L L, the whole being arranged to operate conjointly as and for the purposes set forth.

TAILORS' PRESSING MACHINE—L. B. Storrs, of Canton, N. Y.: I do not claim, broadly, the application of a treadle to a pressing iron, for this has been previously done, and may be seen in hat pressing and analogous machines,

But I claim the lever, C, arm, F, "goose," H, and treadle, D, when connected together and arranged relatively with each other and the press-board, J, so as to operate as and for the purpose set forth.

I further claim the particular manner of connecting the "goose," H, to the arm, F, as shown, viz., having the "goose" provided with the spindle, m, which passes loosely through the sphere, K, of the universal joint, i, whereby the "goose" is allowed an independant rotary movement, it being understood that I do not claim the sphere, K, and fork, l, with its shank fitting in the arm, F, for this is the usual universal joint, but only the peculiarity attending the connection of the "goose" to the sphere, as set forth, in connection with the sphere and fork.

[This invention was illustrated and described on page 312, Vol. XII, SCI. AM.

METALLIC CAPS FOR BOTTLES, JARS, &c.—Wm. J. Stevenson, of New York City: I claim the construction of the cap, B, with the band, d, fitted and united to the exterior of a rim formed upon its head, and with a lap, f, which is left unsoldered or simply tacked so as to be capable of being laid hold of, to strip the band from the exterior of the head substantially as described, when it is desired to open the bottle or vessel.

[This invention consists in a certain construction of metallic caps for preserve bottles and jars and other vessels, which affords great facility for their removal after having been cemented on to the bottles or vessels for the purpose of sealing the same hermetically.]

SMUT MACHINES—Duncan M. Vance, of Urbana, O.: I do not claim the air suction apparatus, e, nor do I wish to be confined to its use in connection with the other parts of my invention, for though of advantage it can be dispensed with and external air be admitted directly into the ends of the fan case. Either one or both of the rubbers may have motion, though the best results are produced when both rubbers move in opposite directions.

What I claim is, first, The reciprocating wire cloth rubbers, g and h, in connection with a rotary fan, constructed and operating substantially as described.

Second, The double inclined grain screen, c, combined with reciprocating rubbers, substantially as described and for the purposes specified.

GRAIN SEPARATORS—A. J. Vandegrift, of Lexington, Ky.: I claim the arrangement of the adjustable feeding tube, I, and distributor, O, within the wind trunk, H, so that the grain may be fed in without allowing a draft or current of air to follow it, and so that the grain may be presented to the blast in thin sheets, and not have their gravitation effected by counter currents or eddies, or accelerated by falling upon each other, or sliding down from above, substantially in the manner and for the purpose set forth.

[An engraving and description of this invention will appear in a few weeks.]

HYDRAULIC RAMS—J. F. Warner, of Philadelphia, Pa.: I claim using the water after passing the puppet valve by conducting it to a vessel or cup or basin, having a waste opening, or openings in the bottom, and used as a power upon a lever or beam to overbalance another power which is greater when the cup is empty, and less when the cup or basin is full. The conducting pipe, D, the closed valve chamber, A, the set screw, I, fixed over the valve, the fulcrum, H, and beam or lever, G, all the parts as substantially set forth or used in combination for the purpose of keeping any hydraulic ram to which it may be attached in motion.

DOOR LOCKS—L. Whitney, of Toledo, Ohio: I do not claim the sliding bolt, C, and tumbler, D, operated upon by a bit, a, for this is a well-known and common device used in the majority of locks.

Neither do I claim attaching a knob, F', to an arbor having a bit, a, at its inner end, for this or its equivalent is used in cases where the arbor passes entirely through the lock and door.

But I claim the combination of the slotted plate, H, arbor, E, and washer, G, as shown, and described.

[This invention is designed for an inside lock or bolt, and is intended to supersede the usual slide bolts and catches hitherto employed for such purposes. The invention consists in the peculiar manner of securing the arbor of the knob in the lock, said knob having a bit attached to its inner end, and operating the bolt as the arbor is turned, the device forming a neat and ornamental affair suitable for buildings of a superior class.]

HARVESTERS—Thos. Wendell, of New Albany, Ind.: I claim the arrangement of the rake, a, on the endless belt, b, operated around and below the stationary platform, C, in the manner set forth, in combination with the shaft, c, belt, d, and lever, H, when these several parts are constructed and arranged and operated in the manner and for the purpose set forth.

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SASH FASTENER—J. B. Whitherle, of Upton, Mass. I claim the combination and arrangement of the retractor, K, the pall, or catch, g′, the spring, h, and the lever, d, applied in the window sash and in relation to the rack, b, of the sash frame, as specified.

PLANING MACHINE—J. A. Woodbury, of Winchester, Mass. : I claim, first, Protecting the face of the board in tongueing and grooving by pressure surfaces, constructed and operating with rotary cutters as described.

Second, The swivel guide, L, when made to operate substantially as described.

Third, Placing the under cutter at or near the end of the frame for the purpose specified, substantially as described.

APPARATUS FOR SUPPORTING AND ADJUSTING GRAVERS FOR ENGRAVING MACHINES—John Hope (assignor to himself and Thos. Hope), of Providence, R. I.: I claim the curved arm or bar, B, and the graver carriage, D, as combined, together and with the graver lever, E, and made to operate therewith, substantially as specified.

I also claim the adjustable weighted arm, F, in combination with the balanced tracer arm or graver. E.

I also claim constructing the tracer carriage, D, in two parts, b c, substantially as described, in order that the tracer or graver may be adjusted in a vertical direction to cylinders or rollers of different sizes.

I also claim making the arm, H, and the stop, L, adjustable on their shaft and rod as described, in order to bring them into proper positions to cause the elevation of the graver under any situation of it on the surface of the cylinder and when the lever, S, is moved backward.

I also claim making the weight. G, in two parts, l m, for the purpose specified.

MACHINE FOR FINISHING SOLDERE TUBING—Edmund Jordan (assignor to the Benedict & Burnham Manufacturing Company), of Waterbury, Conn. : I claim the files or cutters, c c, attached to a tilting stock which is fitted to a reciprocating slide, F, and operated by means of the connecting rod, D, crank, C, and stops. G G′, substantially as and fer the purpose specified.

I further claim the clamp formed of the two plates, I I, attached to the levers, H H, which are connected to a treadle, K, the whole being arranged to operate as and for the purpose specified.

[A notice of this invention will be found on another page.]

EXTENSION TABLE—George Pratt, of Boston, Mass., assignor to John A. Ellis, of Cambridge, Mass., and J. E. Hazleton, of Newton, Mass. : I do not claim a spring catch, nor the mere duplication of such.

But I claim the combination of the auxiliary turning stop h, and its recess, g, or the equivalent thereof with the main stop, f, applied to one of the slides, and the rebate made in the other, the whole being as and for the purpose described.

I also claim the combination and arrangement of the two spring catches, m n, catch bars, q r, and the space, p, whereby during the motion of the supporter, S, on its hinges, one catch is made to pass between the two catch bars and one catch bar to pass between the two catches.

SEWING MACHINES—A. W. Sangster (assignor to V. M. Rice, Joel Thayer, James Sangster, and Eliza Remington), of Buffalo, N. Y., I do not claim the hook detached from the shuttle, because I believe this has been made before; nor do I claim to have conceived the idea of making the rough or serrated foot piece, because serrated foot pieces are now in common use.

But I claim, first, The spring thread carrier, K, in combination with the stationary arm, L, and feeding mechanism operating together in the manner and for purpose specified.

Second, The combination of the shuttle, R, and hook. 7, fastened together, or their equivalents, operating substantially in the manner and for the purpose described.

Third, The shuttle carrier, U, the case, S, and the crosspiece, P, when operating together substantially in the manner and for the purpose described.

HOSE COUPLINGS—Charles Vander Woerd (assignor to Alvah Clark & Sons), of Cambridge, Mass : I claim the arrangement and combination of an elastic tube, E, with the heads of the couplings, A B, so as to cover the joint, j, and allow the same to be kept tight by the pressure of the liquid, substantially as shown and described.

[This invention consists in the employment of an elastic tube or ring placed within the coupling, and arranged in relation to the other parts that the pressure of the water within the hose will keep the coupling water-tight. There is also a peculiar means for connecting the heads of the coupling together.]

MODE OF APPLYING THE POWER OF THE STEAM ENGINE—Jacob Widmer (assignor to himself and Howard Gilbert), of New Haven, Conn. : I claim, first, The combination of the rack, d, with the cams, B B, and groves, b, when constructed, arranged and made to produce the result, substantially in the manner set forth.

Second, I also claim the combination of the levers, h and h, with the rack, d, and cams, g and B B, when the whole is constructed, arranged and made to operate substantially as described.

RE-ISSUE.

ELECTRO-MAGNETIC ALARMS—A. R. Pope, of Somerville, Mass. Patented June 21, 1853 : I do not claim the communication of intelligence by the electric circuit and magnet as a part of my invention or the vibration of the armature for this purpose.

But I claim, first, The mode of breaking and completing the circuit, or vice versa, that is, by the spring circuit breaker operating to cause the vibration of the armature.

Second, So combining a hammer and bell with the self-vibrating armature, that the vibrations of the latter shall produce a continued ringing of the bell under circumstances substantially as described.

Third, The combination of these parts, namely, the circuit breaker, hammer bell, and vibrating armature, or their equivalent or equivalents, with a self-acting spring or key in a door or window to operate so as not only to bring them automatically into action when the door or window is open, but maintain a continuous or continued ringing of the bell by the interruption of the electric current without intervention of other machines.

ADDITIONAL IMPROVEMENTS.

POLISHING APPARATUS FOR WATCHMAKERS' LATHES—J. M. Bottum, of New York City. Patented March 13, 1855—additional improvement dated June 8, 1858 : I claim the construction and arrangement of the polishing apparatus combined with the parts claimed in my former patent, as and for the purposes specified.

TIGHTENING THE TIRES OF CARRIAGE WHEELS—R. R. Scott, of Philadelphia, Pa. Patented March 23, 1858—additional improvement dated June 8, 1858 : Disclaiming the exclusive use of two sets of taper keys for drawing together the two ends of the tire, I claim the ends, B and C, of the tire, with their respective slotted blocks, b and c, the taper keys, and the bolt, G, when arranged for joint operation substantially as and for the purpose set forth.

DESIGNS.

STOVE DOORS—R. H. N. Bates, of Providence, R. I., assignor to himself and Isaac Backers, of Canterbury, Conn., and J. P. Barstow.

A New Gnomon.

A correspondent informs us that a friend of his has invented a new gnomon for sun-dials, which is simply a piece of thread or twine carried at an angle from the center of the dial to a post set at one side. This gives the time at noon with accuracy, which no other gnomon will do.

Dialing.

MESSRS. EDITORS—From the notice of sundials in a late issue of the SCIENTIFIC AMERICAN, I am led to make the following remarks :—

There is no more beautiful or ingenious instrument than the sundial; when correctly made and its use properly understood, it can present the true time with an unvarying exactitude to be found only in the works of the Divine Artificer, upon which its power depends. The only difficulty lies in the variable nature of the shadow's progress through the varying nature of the sun's course, which will give a different reading to the hour circle from the mean, or average or clock time. While the dial indicates solar time, varying with the season, the clock presents equable or mean time, being the precise or exact division of the hours and minutes to their equable length, yet there is no real difference between the two. They both come to the same conclusion, and both precisely accomplish in a given period their due degree. Hence with the smallest possible trouble it is easy to find the very thing sought, and at any time to discover the true clock time. The following table will answer for such indication to any person using a dial:

The sun's center is on meridian, and the dial shows noon on			*H. m. s.*
Jan. 1,	when the clock time shows		12 4 3
Feb. 1,	"	"	12 13 57
Mar. 1,	"	"	12 12 32
April 9,	"	"	12 0 0
May 9,	"	"	11 56 55
June 9,	"	"	11 57 31
" 21,	"	"	12 0 20
July 1,	"	"	12 3 29
Aug. 1,	"	"	12 6 00
Sept. 1,	"	"	11 59 46
Oct. 1,	"	"	11 49 35
Nov. 1,	"	"	11 43 43
Dec. 1,	"	"	11 49 23

By this it will be easy to see how much difference should be allowed for the equation of time, and at any period to find the clock time by the dial indication.

It must be remembered, however, that a dial to be exact must be most carefully placed. Simply setting a dial north and south is not at all sufficient. Pains must be taken to secure a true meridian, and before the dial is located, that meridian should be found with great exactness, so that in setting the dial (if horizontal) the gnomon shall be perfectly adapted to the true meridian of the place where it is to stand.

It would seem that an agreeable and really useful accompaniment to the dial would be a prolongation of the horary circle, sufficient to allow the scale of signs to be inscribed, and the style to track out the sun's path through the heavens, and thus unerringly indicate his place in the ecliptic. If in either side of the astronomic signs the names of the months were written, it would be a most pleasing occupation to notice month by month the progress of the sun in his vibrations backward and forward, and to children it would show clearly the motion of that planet. R. W.

[The above communication on the construction of sundials is not only interesting but valuable, and the facts contained have the freshness of positive experiment, and are consequently of interest to our readers.—EDS.

Inter-oceanic Canal to the Pacific.

MESSRS. EDITORS.—In the last number of your paper I notice an article on the "Inter-oceanic Canal to the Pacific," which, so far as the report of Lieut. Craven is concerned, is perfectly accurate, but is, I think, calculated to mislead those who are not acquainted with the previous history of the project; and as the subject is one of great and universal interest, it is important that no undue prejudice be raised against it.

The proposed route was originally explored by W Kennish, Esq., C.E., whose plans and estimates were published on his return, and submitted to the consideration of eminent engineers, both of this country and in Europe. Their opinion as to the practicability of constructing a canal, without locks, sufficiently capacious for the passage of the largest vessels from ocean to ocean, was unanimously favorable, provided the data furnished by Mr. Kennish should be found correct. The expedition under Lieut. C. was therefore sent, not to survey any new route, nor to make further explorations, but merely to verify the statements of Mr. Kennish. He has not contradicted a single one of these statements so far, and his hasty condemnation of the project is, therefore, wholly without reason, for all the difficulties he urges against it were met and estimated for, in the report of the original survey. In this state of the case it is impossible to pronounce judgment until the report of Lieut. Michler, Topographical Engineer of the late expedition, shall have appeared, when the question will be settled by the scientific world.

These facts should be made known, in justice to the promoters of an enterprise of which, if successfully completed, the whole world may well be proud. Yours,

JAMES A. ROCKWELL.

New York, June, 1858.

A Pleasant Testimonial.

MESSRS. EDITORS—I took out two patents through the Scientific American Agency, bearing date April 21st and July 21st of last year, and I now wish to return you my sincere thanks and good-will for the reliable and beneficial information I received from you and your Examiners. You gave me no trouble in securing my rights; and I now discover that you have made my claims to cover both inventions much broader than I expected, which has made my claims of much more value to me. I shall soon have another case, and shall surely call at your Patent Agency to have it prepared.

JOHN WOODVILLE.

Chilicothe, Ohio, June, 1858.

[We are gratified to receive this pleasant testimonial from our client, and to learn from him that, in consequence of the care taken in the drawing up of his claims, his patents are, on this account, much more valuable to him. It is notorious that inventors who undertake the preparation of their own cases are generally not only bothered very much by the Patent Office before their claims can even be examined, in consequence of defective papers, but when they do succeed, it is rarely, if ever, that their claims can stand a litigation.—EDS.

Successful Copper Mining in Australia.

On the 29th of September, 1845, the work at the famous Burra Burra mines was commenced by twelve miners; they now give employment to 1,031 miners, and support a population of nearly 5,000 persons. Since the commencement of the working, the mines have produced 128,400 tuns of copper ore, yielding 25,700 tuns of copper, which, at the present moment, would be worth in Adelaide $13,415,000. The wages distributed in these mines amount to $4,125,000, while the dividend paid on each $25 share amounts to $1,000. The present value of its shares is $1,600.600. Such an instance of successful mining operations has rarely, if ever, been witnessed in any country.—*American Mining Chronicle.*

Cotton Mills in Saxony.

The kingdom of Saxony possesses, as the mother of the German cotton mills, the largest number of any of the German States, viz., 139 mills, working 554,646 spindles, with a yearly consumption of 34,200 bales of North American cotton, and 34,000 bales of other kinds. A large mill has just been built which will run 50,000 spindles, and consume yearly about 3,500 bales of North American cotton, and 2,000 bales of other kinds. The total number of mills now in working order is 134, running 604,646 spindles, and consuming annually 36,700 bales of North American, and 36,000 bales of other kinds. The largest mill has 50,000 spindles in working order, and the smallest 120 spindles.

Uses of the Potato.

This valuable and nutritious esculent is not only useful to us in the many tempting forms in which it is presented in its unmistakable character, but the farina extracted from it is largely used for other culinary purposes. The famed gravies, sauces, and soups of France are largely indebted for their excellence to that source, and its bread and pastry equally so; while a great deal of the so-called Cognac imported into America from France is the product of the potato, and imbibed as the pure essence of the grape. The fair ladies of our country perfume themselves with the spirit of potato, under the designation of *eau de cologne.* But there are other uses which this favorite esculent is turned to abroad. After extracting the farina, the pulp is manufactured into ornamental articles, such as picture frames, snuff-boxes, and several descriptions of toys, and the water that runs from it is a most excellent scourer. For perfectly cleaning woolens and such like articles, and curing chilblains, it is also successfully employed.

Recent Patented Improvements.

The following inventions have been patented this week, as will be found by referring to our List of Claims :—

FEEDER FOR STEAM BOILERS.—George Brodie, of Little Rock, Ark., has invented a new feeder for boilers, the object of which is to gradually supply steam boilers with water equal at all times to the amonnt evaporated, and used so that the water within boilers will be constantly kept at a given hight, and by the most simple means, requiring the least possible expenditure of power for its operation.

MACHINE FOR FINISHING SOLDERED TUBING.—Edmund Jordan, of Waterbury, Conn., has invented an improved machine for finishing soldered tubing, in which a peculiar means is employed for operating a file or cutter for the purpose of filing or finishing off the soldered seams of the tubes, and there is also a clamp for holding tubes while being operated upon by the cutters. The inventor has assigned his invention to the Benedict and Burnham Manufacturing Company of the same place.

IMPROVED PROCESS OF TANNING.—Jesse Morgan, of Sumterville, S. C., has invented an improved method of tanning leather, which consists in treating hides or skins when they have been partly tanned by the usual process, with a compound of sugar or other saccharine matter, glaubers salts and chloride of soda, for the purpose of completing the tanning process more expeditiously than when it is completed in the usual way, and at the same time making leather equal in quality, weight and durability to that tanned entirely by the old process.

HELYPSOMETER—This is an instrument for taking the altitude of the sun at sea or on land, to which the inventor, J. Oakes, of New York, has given the above name. The end attained by this instrument is, that with it the altitude of the sun can be taken when the natural horizon is obscured by fog or is invisible from other causes. It consists of two parts, one of which is employed to record the altitude by the action of the sun's rays upon a sensitive coating of similar nature to those employed in photographic processes, and the other to measure the altitude thus recorded. The first mentioned portion of the instrument consists of a hollow hemisphere whose equatorial plane is kept in a horizontal position or as nearly so as possible, and has a small orifice in the center, and whose concave is prepared with the sensitive coating. The rays of the sun being admitted through the orifice produce a mark upon the sensitively prepared concave surface, and by applying the measuring portion of the instrument to measure the distance in degrees of a circle from the equatorial plane of the hemisphere, the altitude is obtained, being represented by the said distance in degrees.

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New Inventions.

Machinery Wanted.

Mr. John A. Leclerc, of Montreal, Canada, writes to us for information in regard to machinery for making shoe pegs, also for lathes for turning lasts, ax handles, &c., also a boot crimping machine. There are such machines in this country, and there would be no difficulty in getting them into the Canadas if the government would extend proper protection to the inventor. As it now is, inventors in the United States, deprived of all opportunity to secure their inventions by patent in these provinces, are not over anxious to sell machines to go there, and thereby create a competition which they have not the legal power to regulate.

Improved Coal-Burning Locomotive.

This is an arrangement for regulating the amount of air which is supplied to a coal-burning locomotive, and supplying the air at the requisite speed and pressure by means of a fan blast. Our engravings illustrate fully the invention, Fig. 1 being a longitudinal vertical and central section, and Fig. 2 being an inverted plan of the improvement. The great difficulty which has hitherto been experienced in the use of coal-burning locomotives is, that anthracite requires a strong blast to consume it quick enough to throw out the requisite quantity of heat, and the blast created by the escape steam is not enough for this, therefore some extraneous means, such as a fan-blower, has to be employed. This invention consists in an arrangement of such a fan-blower placed underneath the boiler of the locomotive, and connected with pipes which are provided with valves, and so arranged that the fire may be supplied with a greater or less quantity of air as desired, and when necessary a reverse draft brought down through the flues and the upper part of the fire chamber, in order to lessen the temperature of the boiler.

A represents the boiler of a locomotive. B is the smoke-pipe. C represents the flues which pass longitudinally through the boiler from the fire chamber, D, to the smoke pipe, B. Underneath the boiler a fan, F, is placed. This fan is fitted in a proper box, G, which connects at the center of each side, with a curved pipe, H, the pipe being connected with a pipe, I, which is fitted within the smoke-pipe, B. The way in which pipe, I, is made to communicate with the fan-box is plainly shown in Fig. 2. A valve, *a*, is fitted in pipe, I, near its junction with pipe, H. From the periphery of the fan-box, G, two pipes, J K, project, the lower pipe, K, passes into the fire chamber below the grate, L, and the end of pipe, J, communicates with the open air. The pipes, J K, have valves, *b b′*, fitted or placed on them; these valves, *b b′*, are placed on a common rod or axis, and in reverse positions the valve, *b′*, being open, when *b* is shut, and *vice versa*. M M represent two pipes, one end of which communicates with the fire chamber above the grate, L, and their opposite ends are open to the sides of the fan-box, G. Each pipe, M, is provided with a valve, *c*, the valves of the several pipes all have rods, *d*, attached, which rods extend back at the sides of the fire chamber and within reach of the engineer. The fan, F, is driven by belts or chains, *e*, from the truck axles, the belts being enclosed within proper cases to exclude dust, and thereby prevent the wearing or "cutting out" of them.

The operation is as follows:—When an intense heat is required, the valves, *c c*, in the pipes, M M, are closed, and the valve, *b*, in the pipe J is also closed, *b′* in the pipe, K, being open. The fire will then be supplied with a blast which passes down the pipe, L, through the curved pipe, H, into the fan-box, G, and thence through the pipe, K, into the fire chamber, D, below the grate, L, and through the flues, C, into smoke-pipe, B—see arrows. The strength of this blast may be regulated by adjusting the valves, *a b′*. When the temperature of the boiler requires to be reduced, the valves, *a b′*, are closed, and the valve, *b*, in the pipe opened, and the valves, *c*, in the pipes, M M, also opened. The blast will then pass in the direction of the dotted arrows, down the smoke-pipe, B, through C into D, from thence through M into G, where the fan,

HARTNETT'S COAL-BURNING LOCOMOTIVE.

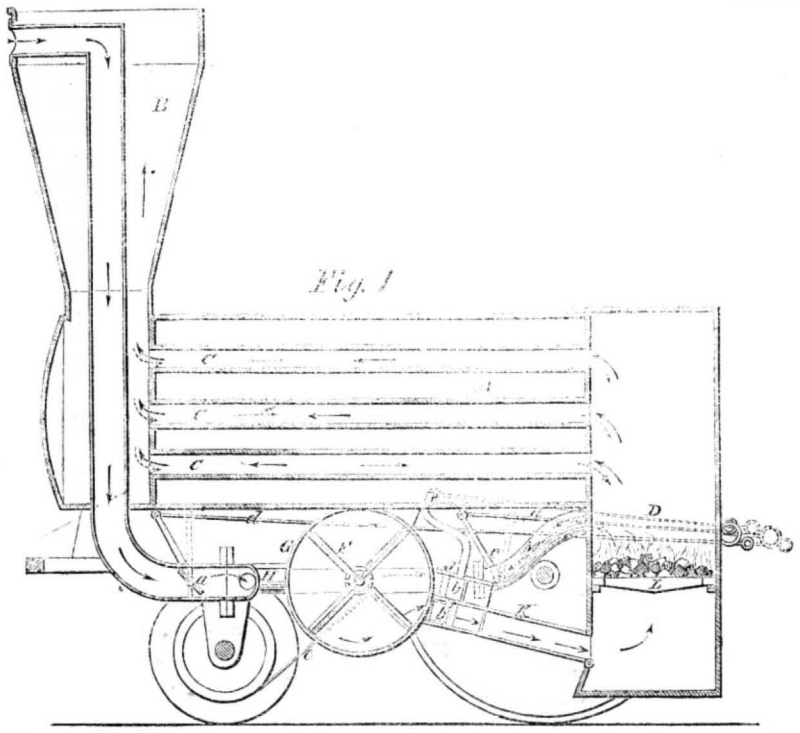


Fig. 1

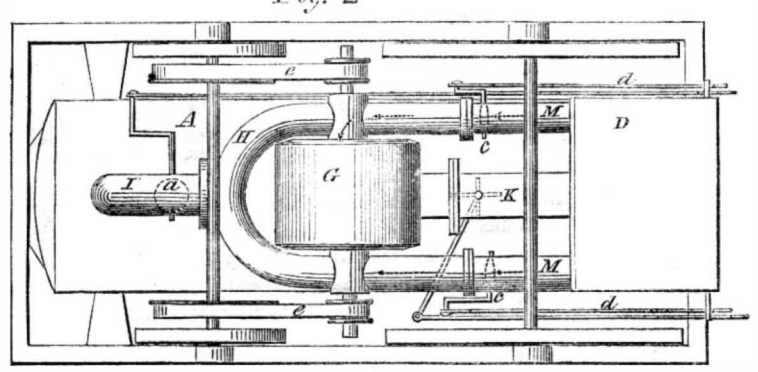


Fig. 2

discharges it into the atmosphere through the pipe, J. This reverse draft cools the flues, and so reduces the temperature of the boiler. By this arrangement the fire of a coal-burning locomotive is placed entirely under the control of the engine driver, and the heat can be graduated as desired. This plan is a great improvement on the usual one, which is closing the flues and ash pan with dampers. It is the invention of J. M. Hartnett, of Wauconda, Ill., from whom any further information can be had. It was patented July 21, 1857.

LA FRANCE'S IMPROVED THROTTLE VALVE.

Fig. 1

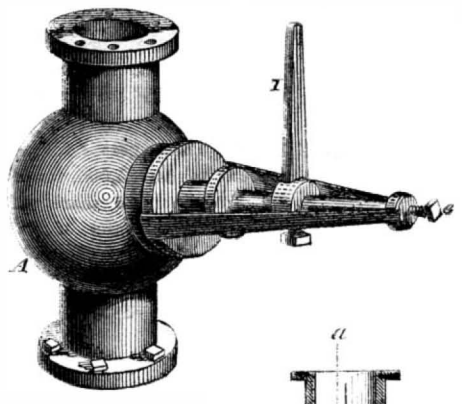


Fig. 2.

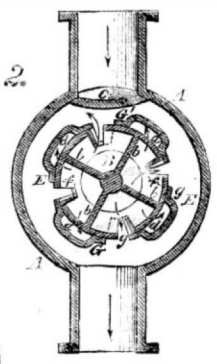
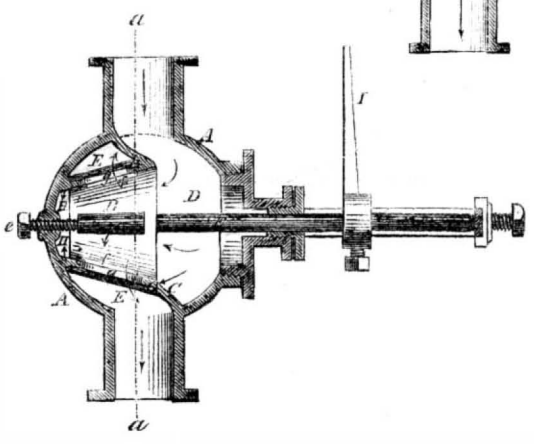


Fig. 3



The improvements which constitute the advantages of this throttle valve will be appreciated from the following description, reference being had to the illustrations, of which Fig. 1 is a perspective view, Fig. 2 a vertical section across the axis, and Fig. 3 a section parallel with the axis.

A is a spherical chamber, containing the valve, B. It is divided by the partition, C C, into the compartments, D and E, one for the admission of steam into the valve, and the other for the passage of steam from the valve ports to the steam-chest. The latter is annular, and surrounds the valve, as seen at E, Fig. 3. The valve is in the form of a hollow frustum, being supported on the axis, F, by four arms or partitions, *b*, which also serve to strengthen against any unequal pressure that it may receive.

The valve seat consists of a shell surrounding the valve, and fitting it closely. It is joined to the partition, C, at one extremity, and to the case, A, at the other. In it are four recesses or passages, *d d*, extending from the chamber, D, and uniting in a single chamber, H, at the end of the valve. The valve stem or spindle is packed and supported in the usual manner, having an adjusting screw at each end, *e e*, to regulate its pressure on the seat; and I is the lever for connecting it with the governor. The valve has four oblong ports or openings at its sides, *f f*; and there are corresponding openings in the seat, *g g*, between the recesses, *d d*.

The steam enters from the boiler into chamber, D, filling the interior of the valve, and also the passages, *d*, and chamber, H. As the ports are opened, it passes into the annular passage, E, surrounding the valve seat, and thence to the steam chest. The course of the steam, both in its passage through the valve and through the surrounding chamber, is indicated by arrows. The adjoining surfaces of the valve and seat are grooved, so as to constitute a steam-tight joint, and the adjustment of steam in and upon the valve is such as to reduce friction to a minimum rate, and thus produce what may be called a balanced valve. The pressure of the steam on a considerable portion of the exterior surface of the valve, by means of the passages and chamber, *d* and H, tends to overcome friction, and makes it sensitive in a high degree, while the interior arrangement is such that the force of the steam in escaping by one port, is counterbalanced by the same force in the opposite positions of the four different ports. The supporting partitions, *b*, receive the back pressure of the steam and throw it upon the center, and form in fact four equal and distinct passages for the steam to the ports. The considerable area of the four ports and their united action produce an extreme degree of sensibility and a very slight turn of the valve varies the opening greatly. So rapid and perfect is its operation that it is difficult to detect a difference in its revolution, when suddenly changing from light to heavy labor of the engine, and *vice versa*.

It was patented April 13, 1858, by the inventor, T. S. La France, of Elmira N. Y., who will furnish any further information upon being addressed as La France & Colman, of the same place.

Wonders of Photography.

H. Garbanati, in an article on this subject in the *American Journal of Photography*, tells us the following:—

"I was recently handed two small pieces of glass, in the center of each was a dark object, about a quarter of an inch square. In the center of the square of one of these, by dint of close and painful examination, I discovered a speck about one-sixteenth of an inch diameter, which bore somewhat the resemblance to a portrait of a head. In the other was also a speck about one-eighth of an inch, and some other very minute specks in the one speck, but which I could not recognize as any particular objects. By holding the first piece of glass up to the light, and looking through a powerful magnifier, I discovered a perfect portrait of about a sixth size, and in the other a group of five equally perfect, of about half size. To what use might not this mode of photographing be put? In war the most elaborate instructions might be carried in a button or head of a pencil-case; and the general or secretary of war needs but a magnifying glass to save the use of spies and men from hanging. The whole archives of a nation might be packed away in a snuff-box. Had the art been known in the time of Omar, the destruction of the Alexandrian library would not have been a final loss."

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Scientific American.

NEW YORK, JUNE 19, 1858.

A Good Chance for Inventors.

Notwithstanding the thought expended and the ingenuity displayed by the inventors of our country toward the improvement of railroad cars, with a view of better adapting them to the comfort of the traveling community, there yet remain two objects for them to accomplish which are not only desirable to companies and travelers, but which are sure to bring to the inventor who is fortunate enough to successfully produce them a handsome income. We allude to some system by which convenient and simple sleeping couches can be provided for night travel, and readily converted into ordinary seats during the day, and some contrivance for ventilating the cars, without admitting the clouds of dust that necessarily enter the cars when the windows are raised or opened.

These subjects have occupied the minds of many inventors for some time, and for several years past statements have gone the rounds of the press in praise of what were erroneously termed improvements for effecting both objects. The efforts of the numerous inventors whose attention they have occupied have not produced the desired effect in a satisfactory manner, although good has resulted from their labors. A few years ago a prize was offered for the best sleeping car by the late F. M. Ray, of this city, but among those exhibited there was not one which was deemed entitled to it.

In this country where we measure distance by thousands of miles, and think no more of a trip by rail from New York to St. Louis, nearly two thousand miles, than they think in Europe of a trip from London to Paris, about three hundred miles, it is with many persons an absolute necessity that the railroad companies should provide them with sleeping accommodations for the night, and in consequence we learn from the letters of our correspondents that there is at present quite an interest among inventors to produce a really good and convenient sleeping car.

We understand that a western railroad company have agreed to give one cent per mile for the use of an approved arrangement of sleeping couches on every car on their road to which it may be applied. This would yield an income to the successful inventor of $1,000 per annum for each car, and as the road employs forty cars, would ensure to the inventor for the single road a tariff of $40,000 per annum. Railroad companies would be justified in paying a liberal sum for the use of inventions for accomplishing these objects in the satisfactory manner desired, for the increase of travel that would follow their adoption would produce an extraordinary increase in the annual receipts of the company.

In case that any of our readers should wish to try their inventive powers on this subject, we will give them the points that are desirable to be remembered in the production of the present desideratum. The car must be simple in its construction, and the seats be capable of reversing as at present, and should be able to accommodate as many sleeping as sitting down; the less shelving the better, and strength combined with lightness are points to be recollected, and above all, rapidity of adjustment either from seats to beds, or *vice versa*, should be the end to be attained.

We have applied for patents for several improvements, but there is still room for further inventions on what are termed "sleeping cars," and we hope inventors will exert their energies in that line until the same facilities are offered for night traveling on railroads as are obtained on our river steamboats. Give us easy seats by day, and convert the seats into a state-room at night, and railroad traveling will then have reached a state of perfection in this country that will make American railroads far beyond those of any other country.

Extension of Patents by the Commissioner and by Congress.

MESSRS. EDITORS—I noticed some weeks since an announcement in the SCIENTIFIC AMERICAN that Charles Goodyear had applied for an extension of his india-rubber patent, and that the time for hearing had been fixed for some day during this month. I am interested in the result of this case, and have been anxiously watching for an expression of your opinion in reference to it, but not one word have you uttered for or against it up to this time. It was in your power to have defeated Goodyear's case if you had taken hold of it in earnest. I now fear it is too late. Why have you permitted this single important case of extension to progress without opposition? I cannot understand your silence.

H.

New York, June 9, 1858.

[Our correspondent refers to the patent of Goodyear, issued on June 15th, 1844, for the principle feature in vulcanizing india-rubber. It embraces the "curing process," which consists in submitting prepared rubber to a high degree of heat, which preserves it from being affected afterwards by atmospheric and other influences, and yet sustains its elastic character. It is a very valuable patent; the process is essential to all the varied manufactures of this material. From the tone and language of our correspondent's letter, it is evident that he does not understand our position in regard to the extension of patents. In commenting upon his communication, we wish him (and all others who may hold similar views and opinions) to note particularly that there is a radical distinction in nature and in character between the extension of patents by the Commissioner, according to an established *general* law, and the extension of patents by *special* acts of Congress; this case of Goodyear comes under the former classification. Our opinions in regard to all such questions are guided by general principles, and have no reference whatever to persons or parties whose interests are likely to be affected by them.

By a general law of twenty-two years' standing—section 18, Patent Act 1836—a patentee may have his patent extended for seven years from the expiration of his first term, provided his invention is a useful one, and he has not been sufficiently remunerated for its use. To obtain an extension, he is required to show proof of the value of his invention, and the amount of remuneration he has received for its use; and all those opposed to the extension are notified to appear, and show cause why it should not be granted. In such cases a fair hearing of both sides—those for, and those against the petition—is obtained, and the Commissioner of Patents, upon the testimony before him, adjudicates in the matter. As good citizens and just journalists we could not, therefore, consistently oppose the extension of Goodyear's patent, or any other person's patent, so long as the application is confined to a general law enacted to meet all such cases. To do so would be to act the part of obstructionists to the fulfilment of the law; and it would also be passing judgment without a requisite knowledge of all the facts of the case. We consider that the Commissioner of Patents is the most competent person to pronounce judgment in such cases. He is sacredly obligated to dispense justice and maintain the law; and as he has all the evidence of both sides before him he is certainly the best judge as to the right and wrong of granting or refusing such extensions. These brief remarks are sufficiently explanatory, and will, no doubt, be satisfactory to all who read them, in regard to our position of silence in cases coming up before the Commissioner of Patents for extension, according to an established law.

We have opposed the extension of patents by Congress upon general principles; and as we entered very freely into the reasons for so doing in the article on page 277, we will now add but a few words pertinent to this question. Most of those patents sought to be extended by Congress have already had the benefit of a seven years' extension, or their owners have been well remunerated, and have been refused an extension upon a fair hearing before the Commissioner of Patents. Every bill enacted by Congress for the extension of a patent, is a new law, in every sense of the term, because it is a special act provided for a private person, and cannot be advocated on general principles. To extend patents by acts of Congress to favored individuals is contrary to the spirit of our government; it involves class legislation, and creates invidious distinctions. All patentees are entitled to stand upon the same level in the eye of the law the rights of one are as sacred as those of another. Our course of conduct in regard to these questions is governed by motives which appear to us to be just, fair, and honorable. We have no personal feelings to gratify, and no private interests to subserve, in opposing the extension of patents by Congress on the one hand, or in remaining silent in regard to those that come before the Commissioner, on the other.

The Agricultural Division of the Patent Office.

Some newspapers whose editors were evidently in want of matter for their respective journals have been making a series of assaults on the agricultural division of the Patent Office, and directing their remarks chiefly against Mr. D. J. Browne, the conductor of that department, charging him with having sent persons to Europe at the government expense, complaining that the seeds were not properly distributed and condemning the agricultural reports. In consequence of this, the Chairman of the agricultural committee of the House of Representatives wrote to the Commissioner of Patents for an account of this department, requesting him to give an epitome of Mr. Browne's history and qualifications. Commissioner Holt replies in one of those elegant, elaborate and yet concise reports for which he has already become noted, and gives such information as clearly satisfied the committee that the charges were false and the assaults unworthy and unprovoked. The Washington *Union* printed this report, and from it we gain the following information.

By means of this department many new and valuable seeds, plants and cuttings have been sent to all parts of the country, where seed stores were inaccessible, and thus the farmer who tills the ground that forms the outskirts of civilization, has an equal chance with, and can produce the same varieties of vegetables and fruits as the farmer who cultivates the soil closer to the busy haunts of man. Again, there are many plants, such as the Brassica tribes, the cabbages and turnips, for example, which deteriorate in this climate, they ripen and grow too fast, the insect attacks the leaves, and thus the plant becomes daily more coarse, and the seed loses power and health, while in Europe they attain perfection, few insects attack them, and as there are more people for a given amount of labor, more attention is paid to their cultivation. This department, then, actually blesses our land by superintending the importation and distribution of fresh seed which will tend to improve our own varieties.

The Commissioner takes the opportunity to make some suggestions for improving the distribution, but states that at present "the utmost care is exercised to secure accuracy, justice, and dispatch in these important duties," and his only complaint is that he has not sufficient to supply the demand.

Of the Agricultural Report he speaks highly and thinks it of great importance, but on this point we have our own opinion which we have not hesitated frequently to express.

The testimonial which Commissioner Holt pays to the scientific attainments of Mr. Browne, shows him to be not only exactly "the right man in the right place," but also a gentleman whose knowledge of agriculture is the result of actual experience on farms or plantations, and he has gained his information as a scientific explorer in nearly all parts of the world, as a railway and canal engineer, as a chemist working in his laboratory, as an author in his study, as an editor in his *sanctum*, ever having at heart the improvement of agriculture in America. It is therefore a credit to the nation to have such a man in the position which he holds, and the position is a proper reward for his valuable services in the cause of practical science.

Goodyear's India Rubber Extension Case.

MESSRS. EDITORS.—The important Goodyear's vulcanized india rubber extension case has been progressing at the Patent Office this week. The patent of Chas. Goodyear for vulcanized gum elastic, dated June 15, 1844, expires on the 15th of this month, unless the Commissioner grants an extension of seven years before the expiration of that date.

This patent of Goodyear's consists in treating rubber with sulphur and heat. The friends or licensees of Goodyear have put forth the most strenuous efforts to obtain an extension of this patent, and the public has also been actively engaged in opposing the extension.

The Examiner, Dr. Thos. Antisell, who has the case in charge, after an immense amount of labor, has presented a very able and elaborate report in the matter. It shows that Chas. Goodyear has personally received $114,000 profit from the vulcanizing patent alone, and after pointing out that great discrepancies existed in the account furnished by Mr. Goodyear in his petition, it recommends that perhaps the extension had better be granted, as it seems hard to send such a man of genius into the world penniless at the age of 58, who has done so much for the encouragement of the arts. It is also alleged by Mr. Goodyear, in his petition, that he is poor and in very feeble health.

Messrs. Blatchford and Brady, eminent lawyers from New York, are counsel for Goodyear, and Stoughton, Greenough, Stansbury, and others, counsel for the American and European public.

The case in behalf of the latter was very ably argued by Mr. Stoughton of New York, and in behalf of Goodyear by Mr. Brady, in a very learned and dignified manuer.

The case will be decided by the Commissioner before the 15th inst., and doubtless a just decision will be tendered, as he is fully qualified to decide in a matter of this magnitude. It is alleged that millions of money hang on this case.

Mr. Goodyear is certainly a man of genius, as the hundred different applications of his invention now on exhibition in the gallery of the Patent Office abundantly testify; among which may be seen almost every kind of stationary articles, carpetings, tents, awnings, coverings, spreads; house, ship, and camp utensils; packing, sheathing, and caulkings; valves, stops, springs, wearing apparel, life preservers, beds, combs; surgical, medical, and philosophical instruments, and a host of other things too numerous to mention.

F.

Washington, June 11, 1858.

[Our correspondent will notice in another place an article bearing upon the extension of patents by the Commissioner. This is, undoubtedly, a very important case, of which fact, no doubt, the Commissioner is fully impressed. It strikes us as somewhat queer that if Goodyear has received $114,000 for the vulcanizing patent alone, he should now appear before the Patent Office "penniless at the age of fifty-eight." We shall be able to give the decision in the case next week.

Dr. James Dean died on the 9th inst., at his residence in Greenfield, Mass. He was distinguished as a geologist, and was engaged on a work relating to the bird-tracks in the sandstone of the Connecticut valley, at the time of his decease. It was to be published by the Smithsonian Institution.

Propeller steamships appear to be fast superseding paddle wheel vessels, both in regard to speed and economy. Those running on the Atlantic make quicker voyages in proportion to their tunnage than the crack steamers of the Cunard line.

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Burning of the Dead.

It will be remembered that, some two years ago, the public mind was horrified by an attempt that was made in one of our western cities, on the part of a husband, to burn the body of his deceased wife. After the excitement had in some degree passed away, the subject was discussed by some of our city journals in a very calm and instructive manner; and it has since received considerable attention from some English physicians. We are not prepared to advocate the burning of the dead, or to dispense with that time-honored system of burial which has obtained in all Christian communities since the days of Abraham; but we consider it a very proper subject for discussion, and could it be proved, in a sanitary point of view, to obviate a more serious evil, we could become reconciled to what is now chiefly regarded as an inhuman relic of a barbarous people. We, however, differ in opinion from those who undertake to show that disease is propagated from the exhalations of graveyards, in cases where they are properly cared for. So far as our own country is concerned, we believe not a single fact can be adduced in support of such an assertion, unless it result from the inhuman disposal of the remains of outcasts in what are known as "Potter's Fields," and which are ofttimes hustled about in premature resurrection by the Vandalism of unprincipled money-getters. The whole evil complained of in European cities, if not purely imaginary, arises from that system of intermural burial which is now nearly dispensed with in all civilized cities.

The *Evening Post*, of this city, notices that a book has lately been published in London, which seeks to show the advantages of the ancient method of burning the dead. The only objection its author, who is a "Member of the College of Surgeons," finds against burial is a sanitary one. He says that "it is proved beyond all doubt, that during the progress of that decomposition which a body undergoes when buried, the elements of which it is composed, before entering into other and purer states, forms certain putrid gases of so deadly a nature that their inhalation in a concentrated state has been known to cause instant death; while in a more diluted form, they are productive of the most serious injury to health. These dreadful effluvia vary much in their virulence, according to circumstances; and there is probably one particular stage of decomposition in which they attain their most fatal power."

Church-yards are, it is well-known, most pestiferous places. And we are assured that the gases emanating from the bodies when diluted, possesses the power of "producing various diseases, diminishing the average duration of life, lowering the tone of the general health, and thereby rendering thousands more liable to be attacked by fever, cholera, or other epidemics. It is not because they are often imperceptible to the sense of smell that they are harmless."

How are these evils to be averted? Thirty-five millions of human beings die every year —nearly four thousand every hour. By what means shall this great mass of decaying substance be so disposed as not to vitiate the air the living breathe, and the water the living drink? The remedy our author proposes is, as we have hinted, that of *burning*. To render the idea less revolting, he proposes a plan which seems to him without objection:—

"On a gentle eminence, surrounded by pleasant grounds, stands a convenient, well-ventilated chapel, with a high spire or steeple. At the entrance, where some of the mourners might prefer to take leave of the body, are chambers for their accommodation. Within the edifice are seats for those who follow the remains to the last; there is also an organ and a gallery for choristers. In the center of the chapel, embellished with appropriate emblems and devices, is erected a shrine of marble, somewhat like those which cover the ashes of the great and mighty in our old cathedrals, the openings being filled with prepared glass. Within this—a sufficient space intervening—is an inner shrine, covered with bright, non-radiating metal, and within this again is a covered sarcophagus of tempered fire-clay, with one or more longitudinal slits near the top, extending its whole length. As soon as the body is deposed therein, sheets of flame at an immensely high temperature rush through the long apertures from end to end, and, acting as a combination of a modified oxy-hydrogen blow-pipe with the reverberatory furnace, utterly and completely consume and decompose the body in an incredibly short space of time; even the large quantity of water it contains is decomposed by the extreme heat, and its elements, instead of retarding, aid combustion, as is the case in fierce conflagrations. The gaseous products of combustion are conveyed away by flues, and means being adopted to consume anything like smoke, all that is observed from the outside is occasionally a quivering transparent ether floating away from the high steeple to mingle with the atmosphere."

Saleratus and Cream of Tartar in Bread.

A long article on the above subject was copied from the Portsmouth (N. H.) *Journal* into the *New York Tribune* of the 1st instant. Its author subscribes himself A. Baker, and his object is to prove that the use of saleratus and cream of tartar in bread and pastry is the cause of the bad teeth so common in our country, and that it is also a fruitful source of disease and premature death. He quotes the statement of Dr. Alcott to prove that 300,000 die annually from the use of saleratus; and he states that in Portsmouth alone 50,198 pounds of saleratus and 15,100 pounds of cream of tartar are sold annually in a population of only 10,000 persons. From these statistics, it seems, that every inhabitant of that city consumes five pounds of saleratus and one and a half pounds of cream of tartar yearly. If these statistics are correct, (but we apprehend they are greatly exaggerated,) there must be a sour set of inhabitants in Portsmouth. Mr. Baker states that Europeans have much better teeth than Americans, and all because the former do not use saleratus in food. He also states that the early settlers of our country and their descendants had good teeth until about fifty years since when the use of saleratus commenced.

The object of Mr. Baker, we have no doubt, is a well meant desire to correct what he considers a national evil, but if he is not correct as to the cause of early decay in teeth, he will do injury rather than good, in thus directing attention to the wrong source of an evil. We are convinced that Dr. Alcott makes sweeping charges which cannot be substantiated against saleratus, in attributing so many premature deaths to its use. It is a well-known fact that there are many families in our country in which neither saleratus nor cream of tartar are employed, and who have no better teeth than others in which these substances are used. We are acquainted with cases of this kind ourselves. An immoderate use of saleratus and cream of tartar in bread must be injurious, as is the immoderate use of any substance in food, but as Mr. Baker asserts that the teeth of the Parisians are excellent, it is evident that he overshoots the mark in his onslaught on saleratus and cream of tartar by our people. When cream of tartar and saleratus are employed in bread-making, the tartaric acid of the cream of tartar unites with the potash of the saleratus, forming the neutral tartarate of potash, while carbonic acid gas is liberated, and raises or lightens the bread. Now, if the tartarate of potash is a poison in bread, as is asserted by Mr. Baker, and if it is the cause of the early decay of American teeth, why does it not produce the same effects upon the teeth of the people of France, when there is so much tartarate of potash in their wine. Our people eat, the French drink the tartarate, and what is the difference? If it is such an evil in America, it ought to be as great in France. All vine casks have a thick, hard crust adhering to them; this is argil or tartarate of potash precipitated from the juice of the grape. The wine-drinking people of France consume far more tartarate of potash annually than the the bread-eating people of Portsmouth. The small amount of saleratus used in bread-baking, we are confident, is not the cause of early decay in the teeth of our people. Some other cause must be hunted up.

Sulphurous Acid.

The application of this acid to manufactures has been much impeded by the difficulty which the preparation of its solution presents on a large scale; for the production of sulphurous acid, as given in books, is always dangerous, especially when its solution has to be prepared in large quantities. This difficulty I have overcome by a process which I here give to the public, and which enables me to prepare thousands of gallons per day of a saturated solution. The process consists in burning sulphur in a small furnace, and conducting the acid gas through earthenware tubes, surrounded with water, so as to cool them. It is then made to ascend through a wooden column, forty feet high, and about four feet wide, filled with pumice-stone, which has been previously washed with muriatic acid, and then with water. Whilst the acid ascends through the porous pumice-stone, it meets a certain and known quantity of water descending, which dissolves the acid. By opening, more or less, a valve at the top of the column, a more or less rapid current is established. With a little care, a saturated solution runs out constantly from the bottom of the column into a confined reservoir, in which it is stored for use until required.

I was led to contrive the above process from a wish to use sulphurous acid in sugar-refining, convinced that it would be far superior to the sulphate of lime (which was so strongly recommended a few years ago by M. Dumas and M. Melseus), because, that by its volatility, it would not remain in the syrups or molasses, and give them, as the sulphate does, a disagreeable taste, in consequence of the lime of the sulphate remaining in the syrup as acetate or lactate. These anticipations were not only realized, but I also found that sulphurous acid possesses two advantages for the sugar refiner: First, that it stops the fermentation of his hot liquors as they come out of the filters; and secondly, when properly applied, it tends to prevent the re-coloration of the liquors during their concentration in the vacuum pan. In practice I found that very successful results were obtained by adding two gallons of a saturated solution of sulphurous acid to every one hundred gallons of decolorized liquor, as it left the char-filter, and was collected in tanks, until pumped up or run into the vacuum pan.—*Professor F. Grace Calvert.*

The Duration of Man's Life.—A New Idea.

A work has recently been published by M. Flourens, the celebrated French physiologist, in which he asserts that the natural length of a man's life is five times as long as the period of growth, and assuming that the latter is twenty years, concludes that the destined pilgrimage of man on earth is one hundred years.

From his own observations, and facts derived from the observations of Buffon, and from natural history, he believes that the proportionate length of life in animals to their periods of growth is established, and now claims to have discovered the peculiar physical change in the system of both animals and men which indicates the completion of growth. "It consists," says M. Flourens, "in the union of the bones to the epiphyses. As long as the bones are not united to their epiphyses, the animal grows. In man the same effect takes place at twenty, and consequently the duration of man's life is five times twenty. It is now fifteen years since I commenced researches into the physiological law of the duration of life, both in man and in some of our domestic animals, and I have arrived at the result that the normal duration of man's life is one century. Yes, a century's life is what Providence meant to give us."

M. Flourens brings some striking and interesting facts forward, to prove the truth of this theory as applied to domestic animals, and claims that it has an exemplification in the relative duration of growth and life in the camel, horse, ox, dog, and other domestic animals. In dividing the several periods of man's life, M. Flourens prolongs the duration of infancy up to ten years, because it is from nine to ten that second dentition terminates; adolescence up to twenty, because it is at that age the development of the bones ceases; of youth, up to the age of forty, because it is only at that age that the increase of the body in bulk terminates. "After forty," he says, "the body does not grow, properly speaking; the augmentation of its volume which then takes place is not a veritable organic development, but a simple accumulation of fat. After the growth, or, more exactly speaking, the development in length and bulk has terminated, man enters into what may be termed the period of invigoration—that is, when all his parts become more complete and firm, and the whole organism more perfect. This period lasts to sixty-five or seventy years, and then begins old age, which lasts for thirty years."

Although we cannot entirely agree with the theory of M. Flourens, that with corrected manners, passions, and habits, the life of man can be prolonged to the lengthened period he mentions, we yet think that with the good conduct he recommends, moderate labor, study, and a systematic course of living, it may not only be extended, but its evening may be sustained in beauty and vigor until night has entirely set in.

What shall we do About Prizes?

Within the past four years we have distributed the sum of $3,700, in prizes for the largest lists of subscribers furnished according to certain prescribed limits. Previous to entering upon this system of awarding prizes, we depended principally on tried friends and canvassing agents to keep the circulation of the Scientific American upon a steadily increasing basis. We have never been disappointed in our friends, but we were cheated, and the public were swindled, by a few unprincipled agents who took money for our paper and never remitted it to us. To save ourselves from suspicion, and the public from being wronged we renounced the system and resorted to one of offering prizes, which has been thus far most satisfactory. Within the next six weeks we must arrange our plans for the new volume which will begin on Sept. 11. We are anxious that the circulation of the Scientific American should be largely increased, and we wish to secure this object in the best and most unexceptionable manner. We are now engaged in maturing some plan for the campaign, and we present this brief statement for the purpose of eliciting an expression of opinion from our subscribers. We would like to receive an immediate response in writing from all those who propose to enter the field of competition, in case we should offer prizes upon about the same scale of last year, ranging in sums from $20 to $300. If these responses are promptly made and are of an encouraging nature, we shall announce within a few weeks a list so that all may begin the competition in good time to commence the next volume. The yearly subscription on all clubs above 20 names will be only $1 40.

Mists.—The formation of mists never takes place if the temperature of the water be lower than that of the atmosphere; but when the cold air above the land mixes with the warmer air above the water, mist or fog will be the result, which will be so much the greater in quantity as the land surrounding the water is higher and deeper. It is by the deposition of water from the atmosphere, through the operation of this law, that the mountains and plains in hot climates are covered with verdure and fertility.

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Correspondents

C. G. W., of La.—You cannot procure a patent for making signs of glass. They are used quite extensively in this city.

T. F., of Ohio.—It is supposed that the vegetable cell is similar in its action to the galvanic cell, but it is a mere supposition. The brown precipitate formed by immersing a zinc plate in a solution of blue vitriol, is a sub-sulphate of copper.

J. S. M., of N. Y.—The composition you mention for brass fixtures is lacquer. It is made with shellac dissolved in alcohol, and colored yellow with tumeric.

B. B., of Ohio.—It is our opinion that the white lead and not the turpentine is the cause of painter's colic in painting with lead pigments. A portion of the lead may evaporate with the turpentine, and be inhaled by the painter; this action has been suggested.

A. S. W., of N. Y.—A steam boiler will evaporate about as much water under sixty pounds pressure as under atmospheric pressure. If your boiler evaporates nine cubic feet of water per hour, it is nine horse power.

J. H., of Ala.—You cannot freeze water by forcing condensed air into it. Dr. Gorrie applied refrigerating liquids for absorbing the heat from water to produce ice in his machine. As far as we have been able to obtain accurate information, no profitable ice-making machinery has hitherto been constructed. You may yet become the successful inventor.

J. R. M. of ——. You have given us no data for calculating the quantity of water which falls per minute therefore we cannot tell you the horse power of your water fall. State your question correctly, and we will answer it.

L. A., of N. Y.—We have had a host of communications on the gyroscope. none containing anything of practical usefulness. We are acquainted with all the experiments related in your letter.

B. M., of N. Y.—Practically we know that water wheels do more work, and furnaces draw better during night than day, but we have not yet satisfied ourselves as to the reason why. Water will flow as fast over a nine foot as over a twelve foot fall.

H. G. W., of N. Y.—We understand that pipes are used upon several lake boats for carrying steam from boilers into the holds of the vessels for extinguishing fires. This method has been recommended as a safety adjunct by the supervising inspectors of steamboats. The idea of employing steam for extinguishing fires is old and well known.

S. A., of Iowa.—Mere static pressure cannot raise water in tubes, as you suppose. As there are 6·26 lbs. of water in an inch tube 20 feet high, the total pressure of 3 lbs. on a piston in a four foot stroke pump making 40 strokes per minute, will raise water 20 feet high through the tube, and discharge its whole contents eight times every minute.

E. A. D., of N. Y.—You cannot successfully heat water in a vat by placing the steam pipe upon its surface. Water will not conduct heat downwards; so that if you wish to accomplish your object, you should place the heating pipes at the bottom of the vat. A steam jacket when applied to an engine, is a casing filled with steam, for keeping the steam in the interior of the cylinder hot. It is known to be an economizer of fuel. Watt discarded it for a while, but resumed its use again for the above reason.

J. W. S., of Ohio.—You are mistaken in supposing that telegraph companies could not use several wires twisted together for conductors, on account of their too great conducting powers. They have found that when one wire can do the work it is absurd to use more; just as it would be an erroneous policy to build and use three or four tracks of railroad to do work that can easily be accomplished on a single track. A lightning rod is efficient according to its solid section; this is the opinion of Professor Faraday.

S. & M., of Ky.—If you own a town, county, or State right in a patented invention, and any one should introduce the same improvement within your territorial limits, he is liable to you for damages, and you can sue and recover from him. It would be r diculous indeed if the purchaser of a patent right to a specific locality could be interfered with by the mere introduction of the invention from some other market, and have no remedy.

G. H., of Del.—Constructing diaphragm pumps in the manner you describe has been done before, and is not, therefore, patentable.

S. U. S., of Ill.—By taking a common pencil, and holding it vertically to the eye, and observing how much of its length is necessary to cover the figure of a man at any known distances, say one hundred and two hundred yards, and then cutting notches in the pencil at the exact points, you will be able at any time, by this simple means, to approximate closely to the distance a person may be from you. A knowledge of this simple fact may prove of service in many cases. We know nothing of a bass viol operated by horse-power. It must be a curious affair.

J. C. C., of Tenn.—We have never published an engraving of Halsted's turn-table. Wm. Howe has had three patents granted to him on bridges. Two were issued in 1840, and have expired, and one was granted in 1846, and will not expire, therefore, until 1860.

C. C., of Pa.—Models sent to us without the name of the inventor attached, are liable to be mislaid and forgotten. The law requires the applicant's name to be put on his model.

W. W., of N. J.—To preserve your boiler from rusting while it stands idle, introduce some oil into it just before it is stopped, and then run off all the water. A thin coat of oil will thus be left upon the metal to protect it.

F. G. S., of Mass.—Build your small boiler of a cylinder form, like that of a locomotive. Insert the steam pipe into its top when you have no dome. The power of an engine does not depend on the length of its stroke, but the pressure of steam, and the velocity and area of the piston. Cement for cast iron is composed of twenty pounds of iron filings, one ounce of sal ammoniac, and half an ounce of the flower of sulphur, made into a paste with water.

Money received at the Scientific American Office on account of Patent Office business, for the week ending Saturday, June 12, 1858:—

L. H., of La., $24; J. R., of Ohio, $25: U. T. S., of Tenn., $30; T. G. Y., of N. Y., $25; G. W. S., of Ill., $30; J. H. Q., of Mich., $24; A. S. L., of N. Y., $100; A. R., of N. Y., $30; W. T., of Me., $55; R. H. C., of Ala., $30; G. W. B., of N. Y., $25; E. B., of Mo., $30; F. M., of Ill., $30; W. H. B., of N. Y., $55; A. D., of Mich., $25; J. A. A., of Texas, $30; B. & P., of Mass., $55; S. S., of L. I., $57; S. N. L., of N. Y., $30; J. F., of Mass., $81; C. W. & W. W. M., of Ill., $15; H. N., of N. Y., $45; S. B. S., of Mo., $30; P. M., of Ill., $30; J. J. W., of L. I., $30; M. D., of Conn., $250; O. D. W., of N. Y., $25; G. F. D., of Pa., $30; W. S., of Mo., $10; J. D., of Ohio, $20; W. W. H., of Texas, $30.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, June 12, 1858:—

J. R., of Ohio; L. H., of La.; J. H. B., of R. I.; E. B., of Mo.; F. B, N., of N. Y.; J. H. Q., of Mich.; T. G. Y., of N. Y.; J. L. S., of Tenn.; A. D., of Mich.; T. E. McN., of Pa.; O. D. W., of N. Y.; W. H. B., of N. Y.; G. W. B., of N. Y.; D. H., of N. Y.; J. D., of Ohio; H. N., of N. Y., (2 cases).; S. L., of L. I.; J. F., of Mass., (3 cases); T. E. P., of N. Y.

Literary Notices.

TROW'S NEW YORK CITY DIRECTORY. Compiled by H. Wilson. We have just received this valuable Directory for the years 1858-9, containing 139,804 names, all of which have been collected, arranged, printed and bound in one month. To praise a Directory would indeed be a work of supererogation as its value and usefulness are appreciated by every one. It is published by J. F. Trow, 377 and 379 Broadway, New York, for $2 50.

WILSON'S BUSINESS DIRECTORY for 1858-'9—published by J. F. Trow—contains the names and addresses of all the business men of this city, classified under their respective occupations. The price is only $1, and no office or store should be without it.

AMERICAN VETERINARY JOURNAL—G. H. Dadd, V. S.- Boston, Mass.—This periodical which is so full of information on all subjects relating to the veterinary art, and the treatment of cattle generally, is so cheap (only $1 per annum) that the owner of any quadruped. equine or bovine, must really be neglecting his own interests if he does not take it.

THE AMBROTYPE. By Chas. Seeley, A. M. This practical little treatise upon the art of producing collodion positives has attained a second edition. It is a very complete and correct manual, and should be in the hands of every photographer.

THE MUSICAL WORLD—R. S. Willis. Editor—The number for this week contains a beautiful piece of music, by R. Goldbeck, composed to the words, "Let me Weep," by Anna Freeman. It is also full of interesting matter for the home circle or the desultory hour.

THE AMERICAN JOURNAL OF PHOTOGRAPHY—Published at 424 Broadway, New York—This periodical has just commenced a new series, and there are many improvements with the new volume. It is an excellent magazine and very cheap.

THE ECLECTIC MEDICAL JOURNAL—Published by R. S. Newton, M. D., Cincinnati.—The June number contains some excellent articles upon medical subjects and hygiene, all, however, treated according to the theories of the so-called eclectic school.

IMPORTANT TO INVENTORS.

AMERICAN AND FOREIGN PATENT SOLICITORS.—Messrs. MUNN & CO., Proprietors of the SCIENTIFIC AMERICAN, continue to procure patents for inventors in the United States and all foreign countries on the most liberal terms. Our experience is of twelve years' standing, and our facilities are unequaled by any other agency in the world. The long experience we have had in preparing specifications and drawings has rendered us perfectly conversant with the mode of doing business at the United States Patent Office, and with most of the inventions which have been patented. Information concerning the patentability of inventions is freely given, without charge, on sending a model or drawing and description to this office.

Consultation may be had with the firm, between nine and four o'clock, daily, at their principal office. 128 Fulton street, New York. We have lately established a Branch Agency on the corner of F. and Seventh streets, Washington (opposite the United States Patent Office). This office is under the general superintendence of one of the firm, and is in daily communication with the Principal Office in New York, and personal attention will be given at the Patent Office to all such cases as may require it.

We are very extensively engaged in the preparation and securing of patents in the various European countries. For the transaction of this business we have offices at Nos. 66 Chancery Lane, London; 29 Boulevard St Martin, Paris, and 26 Rue des Eperonniers, Brussels. We think we may safely say that three-fourths of all the European patents secured to American citizens are procured through our Agency.

Circulars of information concerning the proper course to be pursued in obtaining patents through our Agency, the requirements of the Patent Office, &c., may be had gratis upon application at the principal office or either of the branches.

Communications and remittances should be addressed to MUNN & COMPANY,
No. 128 Fulton street, New York.

The annexed letter from the late Commissioner of Patents we commend to the perusal of all persons interested in obtaining patents:—

MESSRS. MUNN & CO.—I take pleasure in stating that while I held the office of Commissioner of Patents, MORE THAN ONE-FOURTH OF ALL THE BUSINESS OF THE OFFICE came through your hands. I have no doubt that the public confidence thus indicated has been fully deserved, as I have always observed, in all your intercourse with the Office, a marked degree of promptness, skill, and fidelity to the interests of your employers.
Yours, very truly, CHAS. MASON.

WOOD-WORKING MACHINERY—LANE & BODLEY, Cincinnati, Ohio., manufacturers of all kinds of wood-working machinery. Morris' patent Wood-Benders, for any shapes or purposes—more effective and economical than any other in use.

ARTESIAN WELLS—WANTED TO EMPLOY immediately, a practical artesian well-borer. Address WM. STICKNEY, Washington City, D. C.

SPECIAL EXTRAORDINARY OFFER—The great fifty cent Pictorial Monthly. The United States Journal commences its tenth volume with the July number; and determined, regardless of any outlay, to give it an immediate introduction into every neighborhood, we make the following special offer:—To any person who will send us two subscriptions ($1), we will present either a beautiful copy of Fleetwood's Life of Christ, containing about 500 pages, elegantly bound, and profusely illustrated, or we will present a splendid copy of Livingston's Travels in Africa, superbly bound and illustrated; or a copy of the magnificent steel-plate engraving, "Signing of the Death Warrant of Lady Jane Grey." The postage on the books is 24 cents each, and on the engraving 12 cents, which must accompany the order. If anybody is fearful that the above offer will not be carried out, they can deposit the amount and postage with their postmaster, to be forwarded by him on receipt of the premium and first number of the paper. We will also send our catalogue of rich offers. J. M. EMERSON & CO.,
406 Broadway, New York.

FOR SALE AT A BARGAIN—ONE NEW 13 ft. Iron Planer, weight 10,000 lbs. One new 18 ft. Engine Lathe, swing 30 inches. One second-hand Engine Lathe, swing 21 inches. One Upright Drill, six Shaft Straighteners, six Bolt Headers. For particulars address or inquire of WM. T. SCRANTON, New Haven, Conn.

S. D. BARNETT, MALLEABLE AND GREY Iron Foundry, Hamilton, corner of McWhorter st., Newark, N. J. Orders promptly attended to.

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REED'S PATENT PORTABLE AND STATIONARY STEAM ENGINES, unequaled for simplicity, durability, and economy. Birkbeck's improved Steam Pumps, Portable Steam Saw and Grist Mills; second-hand engines and boilers. Most improved machinery of all kinds, furnished by JOHN A. REED, No. 172 Broadway, corner of Maiden Lane, New York City.

These machines have no rival.—[Scientific American.

WHEELER & WILSON'S SEWING MACHINES, 343 Broadway, New York, received the highest premiums awarded in 1857 by the American Institute, New York; Maryland Institute, Baltimore; and at the Maine, Connecticut, Illinois, and Michigan State Fairs. Send for a circular containing editorial and scientific opinions, testimonials from persons of the highest social position, &c.

MACHINISTS' TOOLS FOR SALE AT HALF PRICE—I will sell the remainder of the tools belonging to the estate of John Parshley at half price, if called for soon. Said tools are new, and in good order. They consist in part as follows:—One 16 foot planer. 10 hand lathes, 2 spliner drills, 13 No. 1 drills, 1 bolt header, 1 shaft straightener, plane centers and jaws. chucks, all sizes; also 8 of Foster's building block machines.
N. D. SPERRY, Trustee, New Haven, Conn.

BELTING AND PACKING—Niagara Falls Paper Manufacturing Co., Niagara Falls, April 20, 1858. United States Gutta Percha Co.: We duly received the Gutta Percha Belting ordered from you, and after giving it a thorough test the past winter, on our heaviest engines, constantly exposed to water, ice and oil, and making 140 to 160 revolutions per minute; and again on two of our largest "Gwynne Pumps," making from 600 to 700 revolutions per minute, they have given us entire satisfaction, and we think it decidedly the best belting we ever used, and you may look for our future orders as required. S. PETTIBONE,
Treasurer and Superintendent.
For sale by the UNITED STATES VULCANIZED GUTTA PERCHA CO., No. 66 Liberty street, New York.

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Science and Art.

The Loss of the Ava.

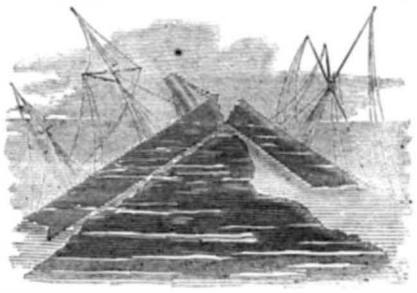
The following remarks and sketch, explanatory of the manner in which the *Ava* was lost, are taken from a new scientific journal published at Calcutta, entitled *The Engineer's Journal and Railway Chronicle*:—

"We give below a rough sketch, kindly sent us by a correspondent, illustrative of the manner in which the P. and O. Company's steamer *Ava* was lost. After striking on the rocks, she appears to have broken her back amidships, and then to have gone down.

The rock on which she struck is between Pigeon Island and the mainland, about nine miles north of Trincomalee. It is reported that a fishing light was mistaken for the harbor light, which might easily have been the case, because the latter is a disgrace to the fine harbor, the entrance to which it is intended to show.

The *Ava* had on board the only shaft in India that would fit the *Alma*. The last-named vessel, therefore, will have to wait until a new shaft is ordered, made, and can be sent out from England.

The passengers, as our readers are doubtless aware, were all saved, but suffered severe privations. Among them were several refugees, and, we believe, some of the Lucknow garrison. The greater part of the mails and the cargo have gone down with the vessel. In addition to a very valuable cargo there was upwards of £266,000 in specie on board. There is evidently no reason why, with a pro-



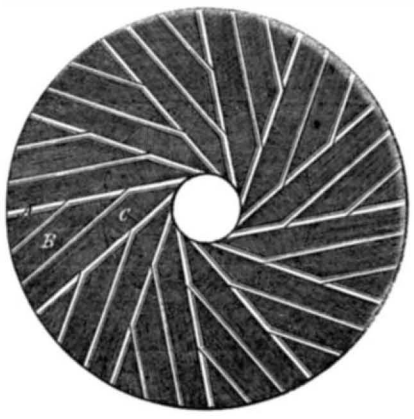
per diving apparatus, a large amount, if not all, of the specie should not be recovered. The precise spot where the vessel went down is well-known, and there is apparently no difficulty in the matter. The Peninsular and Oriental Company will certainly be very unwise to abandon the wreck without an attempt of some kind being made. If it is abandoned, it will turn out a most profitable speculation to those who embark in recovering it."

Late advices speak not only of the shaft of the *Alma*, said to be worth from £2,000 to £3,000, being recovered, but also of several boxes of specie. When the last accounts left the wreck, the work of recovery was going merrily on, and there appeared every reason to hope that the valuable part of her cargo would be saved.—*London Engineer*.

Natcher's Millstone Dress.

The improvement in the millstone dress which is illustrated in the accompanying engraving is the invention of Gabriel Natcher, of Indianapolis, Ind., and two patents were granted to him April 27, 1858, for his invention, one for the dress and the other for the tool which he employs to cut the stone.

The whole of the face of the stone being polished as smooth as possible, the tool which we will now describe is used. It is composed of one or more diamonds, inserted in a handle, and when two or more are used they are to be firmly set in a row at equal distances apart. The crack or grinding surface is commenced at A. The furrows or cracks, A and B, are produced by running the diamonds over the face of the stone by the side of a straight ruler. The curved lines, as represented at C, are made by operating the diamond by the the side of a curved ruler. The width of the space separating the lines upon the grinding surface of the stone is regulated by holding the points more or less diagonally across the line of motion. In the usual mode of dressing stones, a pick is used, which being brought down upon the face of the stone produces the stellated fracture, thereby weakening the stone as far as the fracture extends. Thus the edges of the cracks weakened by the blow from the pick soon crumble away, wearing the face of the stone as the particles thus detached are thrown out. All these disadvantages are entirely prevented by this mode of dress.



The line cut by the diamond upon a glossy surface which has never been disintegrated by a blow from a pick is clear and distinct, having its edges sharp and fine with no disposition to crumble, the cohesion being perfect up to the edge of the crack, thereby insuring a sharp corner or cutting edge perfectly straight and equal. The stone will be more perfect when dressed again upon this plan, as the diamond gets below the bruises occasioned by the old mode of dressing with a pick. The furrow is smooth, having the side upon which the grain rises a regular inclined plane. The passage of the grain to the face is uniformly checked by the lines at A, where the bran is taken off. As there is no crushing contact of the stone with the wheat, the sharp edges of cracks or small lines cutting or shaving up the grain, while no roughness or inequality is allowed although brought close together.

The flour comes from the stone with all its nutrition, as the stones run very close, scraping the bran clean without cutting it up. There is no perceptible moisture generated in the operation of grinding by this mode, and the spouts are clean and dry, because the grain is moved to the eye by the retarding curved lines until well ground, and while the motion is less rapid, and consequently less liable to heat, the pressure being the same, when, having reached the extreme of the breast-circle, it is rapidly thrown from the stone, finding few or no irregularities to retard its progress.

The inventor has sold half his interest to A. P. Orton, of the same city, from either of whom further particulars can be obtained.

Drawing Iron.

When a bar of wrought iron is broken by a weight being placed upon it, it is supposed by many persons that the remaining parts are rendered weaker than they were before, on account of the strain to which they have been subjected. This is a mistaken idea. Such pieces of iron bars are generally stronger, according to their diameter, than they were before the bar was broken. The strain to which they have been subjected, by drawing the fibers closer together, increases their density, and, as a consequence, the strength of the metal. A wire of one-eight of an inch in thickness is, *proportionably*, stronger than one twice the thickness, simply because its fibres are packed closer together by the operation of drawing.

The British Post Office.

From the report of the Postmaster General of Great Britain, as published in *Hunt's Merchant's Magazine*, we cull the following information:—Since the improvement of the letter delivery system, there has been a free delivery of 300,000 letters per week or about sixteen millions a year. In London alone, the number of places where letters can be posted has been increased by the addition of sixty new receiving houses and sixty-six letter pillars—cast iron columns set up in the street, from which letters are collected. From 1840 to the present time, the net annual revenue has increased three and a half times the amount—it is now $7,252,075—while the expenses have only doubled, being for the past year $8,604,075, and the amount of money transmitted through the Post Office in the shape of money orders was $60,901,365. All this is due to the energy and genius of one man—Rowland Hill.

Douglass' Railroad Car Spring.

This invention relates to springs of the description known as "elliptic," and consists in a novel mode of constructing and combining the upper and lower plates of the spring, whereby greater strength is obtained with a less weight of metal than is required in springs of the usual construction.

In our engravings, Fig. 1 represents this improved spring as adapted to railroad cars; Fig. 2 is a side elevation of the same, modified and applied to a locomotive truck; and Fig. 3 is a side view of a double elliptic spring, constructed upon the same improved plan, and designed for ordinary carriages.

The ends of the upper leaf, A, of the spring, are bent around bolts, B, secured in jaws attached to the truck, C, of railroad cars, or to jointed bars, I J, on which is suspended the truck of the locomotive, and the lower leaves, E, which are made of different lengths, in the same manner as the common elliptic springs are made, of a more rounding curve, so as to leave the space between the center of the upper and longest leaf, and corresponding part

Fig. 1

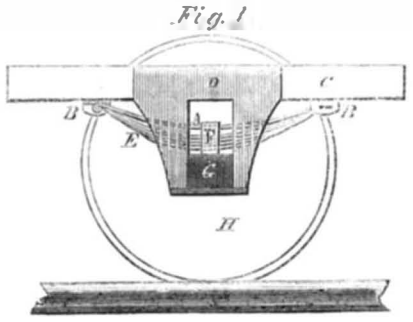


Fig. 2

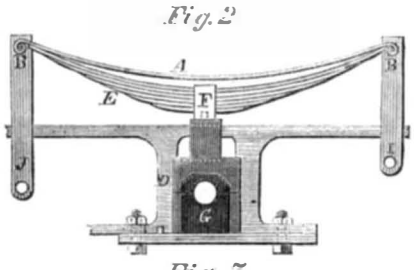


Fig. 3

of the leaf, A, when they are arranged below the same, with the ends of the upper longest leaf sprung in between, and arranged against, the rounded ends, B, of the leaf, A. The leaves, A E, are held in their places during their elastic movements over each other by the usual clips, near the ends of the lower ones, and by right-angled jaws, F, between which they are placed, which jaws are secured to the journal boxes, G, arranged between the guides, D, secured to the truck of the car or locomotive. When this plan of spring is employed for ordinary carriages, the leaves, *a b*, are arranged in the relation together represented in Fig. 3, and are connected together by joint pins at *c*.

It will be seen that the spring is supported at the center of the lower leaves, E, and receives the weight of the car or other object at or near the ends of the upper leaf, A. The tendency of the weight thus applied is to cause the plates, E, to be straightened, and this tendency exerts a tension in a nearly longitudinal direction on the plates, A *a*, so that while the plates, E *b*, yield considerably in the direction of the pressure, the plates, A *a*, though sufficiently elastic, yield but slightly, and serve to give great strength to the spring.

Springs constructed on this plan have been in operation on the heaviest tenders on the Delaware and Lackawanna Railroad for a year past, and they are found to be capable of sustaining a far greater pressure with an equal degree of elasticity, and a saving of at least twenty per cent of steel, than the ordinary construction of springs.

This excellent form of spring was patented December 29, 1857. Any further information can be obtained by addressing the inventor, George Douglass, Scranton, Luzerne county, Pa.

Habits of Grasshoppers.

A Goliad correspondent of the Colorado (Texas) *Citizen* gives some curious facts in relation to the grasshoppers which have recently swarmed in that region. He says:—

"They have an especial fondness for wheat and cotton, but don't take so kindly to corn. The only vegetable they spare is the pumpkin. The most deadly poisons have had no effect upon them; fumes of sulphur they rather like than otherwise; musquito nets they devour greedily; clothes hung out to dry they esteem a rarity; blankets and gunny-bags they don't appear to fancy. They swim the broadest creeks in safety, sun themselves awhile, and then go on. The whole mass appear to start and move at the same time, traveling for an hour or two, devouring everything in their way, and then suddenly cease, and not move perhaps for a week, during which time no feeding is noticed; and finally, they carefully avoid the sea-coast."

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